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THE AVICULTURAL MAGAZINE

BEING THE JOURNAL OF THE
AVICULTURAL SOCIETY

EDITED BY
PHYLLIS BARCLAY-SMITH, M.B.E.

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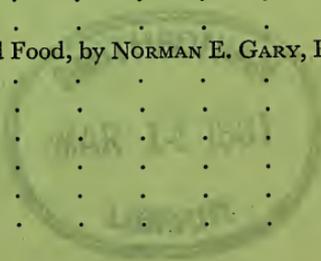
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THE AVICULTURAL SOCIETY

Founded 1894

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Assistant Secretary : Miss Kay Bonner.

Membership Subscription is £1 per annum, due on 1st January each year, and payable in advance. Life Membership £15. Subscriptions, Changes of Address. Names of Candidates for Membership, etc., should be sent to the Hon. Secretary.

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The annual dues of the Society are \$2.50 per year, payable in advance. The Society year begins 1st January, but new members may be admitted at any time. Members receive a monthly bulletin. Correspondence regarding membership, etc. should be directed to the Secretary.

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SWINHOE'S PHEASANT.

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JANUARY-FEBRUARY, 1961

SWINHOE'S PHEASANT

(*Lophura swinhoei*)

By PHILIP WAYRE (Norwich, England)

Swinhoe's Pheasant is found in the wild only on the island of Formosa where it inhabits mountainous country at moderate altitudes. It has never been common and to-day may well be on the verge of extinction in its native land.

This bird was discovered by the English naturalist Swinhoe in 1862, and the first pair to reach Europe came to France in 1866. They were bought by Baron de Rothschild who bred many young birds and founded the stock in captivity. It is doubtful if any were imported into Europe from Formosa after the end of the nineteenth century, and to-day captive stocks both in this country and in America must be highly inbred.

According to the census of ornamental pheasants conducted in 1958, there were at that time not less than 120 Swinhoe's Pheasants in captivity in Great Britain. The number has probably increased a little since then.

In 1958 two pairs of wild-caught Swinhoe's were obtained from Formosa by Dr. K. C. Searle of Hong Kong. These were sent to England and were presented to the Ornamental Pheasant Trust, then in the process of formation, by Miss Kay Bonner and Mr. A. A. Prestwich. From these birds two young cocks were reared that year and these have since been mated to home-bred birds. The Trust has, therefore, a much-needed change of blood with which to work.

Swinhoe's Pheasants are very beautiful and soon become tame. The cock has a crisp plumage with a wonderful metallic iridescence. The hen is also more colourful than many hen pheasants, with bright red legs and a nicely patterned plumage formed by the chestnut and black centres to her feathers.

This species does well in captivity even in small aviaries, and is

hardy. A cock can often be run with two or even three hens. Swinhoe's sometimes breed the first year after birth though most do not start until their second year. The male assumes full adult plumage the first year. The eggs hatch quite well in incubators if given the same treatment as ordinary game pheasant eggs, and the young are easy to rear either under bantams or electric brooders. They thrive on food such as turkey starter crumbs and it is advisable that these should include a blackhead preventive of which several kinds are available commercially.

* * *

ORNAMENTAL PHEASANT TRUST—ANNUAL REPORT 1960

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REPORT OF COUNCIL, 1960

A little over a year ago the Trust came into being and since then it has developed rapidly. The collection of game birds is now the most comprehensive in Britain and almost certainly one of the largest in Europe.

The rise in membership has not been quite so spectacular. At the moment it stands at nine life members, twelve sustaining members, and 119 ordinary members, a total of 140. It is anticipated that there will be a rapid increase in membership as soon as the collection can be opened to the public. The search for another property in Norfolk on which to keep the collection continues. As soon as a suitable place can be found the collection will be moved there and the public admitted. In the meantime the birds are kept at the Director's home. Members and their friends are always welcome, but are requested to give prior notice of their intended arrival. Over 250 people visited the Trust this year.

Considerable publicity has been achieved during the year on behalf of the Trust. This has included articles and letters in the National Press, including *The Times*. The Director has made a short film of some of the birds in the collection and has shown this both on Anglia Television and at various lectures. It is hoped to intensify this campaign in the future.

Useful contact has been made with Zoological Societies abroad, including several behind the Iron Curtain. It is hoped to exchange birds with these Societies to our mutual advantage in the future.

The Trust has been accepted by the Inland Revenue Authorities as a charitable educational institution and is therefore exempt from income tax.

It is with much regret that your Council has to report the death of the Earl of Belmore at his home in Northern Ireland last July.

Professor Alessandro Ghigi of Bologna has agreed to become an Honorary Vice-President of the Trust. Professor Ghigi has one of the finest collections of game birds in Europe.

During his brief visit to this country in September Monsieur Jean Delacour visited the Trust's collection and was able to give much useful advice.

An offer of co-operation was made to the Nature Conservancy in their work on the effects on game birds of poisonous crop sprays. This offer was accepted on behalf of the Conservancy by Dr. M. W. Moore of Furzebrook Research Station.

During the last year samples of egg-white from infertile eggs have been sent to Cornell University, U.S.A., where our Council Member, Professor Charles Sibley, is conducting research into the taxonomic relationship of birds by means of the electrophoresis of egg-white protein.

The work of the Trust is falling into two main fields—first that of conservation ; to preserve species of game birds threatened with extinction in their native haunts by propagating numbers in captivity. Secondly, the broader aspect which includes the keeping of a representative collection of game birds for comparative study and research, the enlightenment of the public on the problems connected with these birds, and the further education of the rising generation.

Importations

A total of fifty-two birds has been imported during the past year and of these thirty-eight are still alive in the collection. At first sight the losses (fourteen) may seem rather high but it should be remembered that all of these were wild-caught birds and the great majority had to endure sea and air travel from Borneo and China. Virtually all these birds were obtained for the Trust by Dr. K. C. Searle of Hong Kong who went to unlimited trouble both in collecting the birds and in packing and shipping them. Dr. Searle also went on a collecting expedition to Borneo where he obtained some very rare and interesting birds for the collection.

Your Council is extremely grateful to Dr. Searle for his hard work and enthusiasm and also wishes to convey its thanks to Mr. George Mottershead of Chester Zoo, and Mr. D. H. S. Risdon of Dudley Zoo for their kindness in providing quarantine for birds for the Trust. Without their help it would not have been possible to import a single bird.

The following forms have been imported during the last year :—

	<i>M.</i>	<i>F.</i>
Cabot's Tragopan	5	2
Szechuan White Eared Pheasant	—	1
Common Koklass	1	1
Bornean Great Argus	1	2
Greater Bornean Crested Fireback	3	4
Lesser Bornean Crested Fireback	1	2
Roulroul Partridge	3	3
Chinese Francolin	2	2
Chinese Bamboo Partridge	2	2
Formosan Bamboo Partridge	—	1
Tonkinese Red Junglefowl	1	3
Bornean Tree Partridge	4	1
Stone Partridge	1	1
Indo-Chinese Green Peafowl	1	2

After four weeks in quarantine birds join the collection. Tropical species which arrive during the summer are put outside in large planted pens. Those arriving during the winter are put into heated quarters until acclimatized. In this way losses have been kept to a minimum and all the birds have settled down well.

The Collection

The breeding season has been moderately successful and over 150 young birds were reared including five of the rare Scintillating Copper Pheasant. The greatest problem has been infertility, particularly in the rarer species; this is no doubt due to existing stocks in this country being highly inbred and emphasizes the importance of fresh importations.

Two male Swinhoe's were bred from the wild-caught birds so generously given to the Trust by Mr. A. A. Prestwich in 1958. These have now been mated to home-bred hens and should provide a much-needed change of blood; they were probably the first wild Swinhoe's to be imported into Europe from Formosa during this century.

Breeding results could hardly have been expected from the birds recently imported from Borneo and other parts of the Far East, since they had not had sufficient time in which to settle down and become acclimatized. They have all started the winter in excellent condition.

Three main types of pen are used at Great Witchingham. The first and most satisfactory for breeding birds is a large open-topped enclosure 9 yards wide by 20 yards long. Each pen is well planted with flowering shrubs and contains a shelter for the birds. The sides are 9 feet high with an overhang inwards at 45 degrees. Pheasants kept in these permanent pens have to be pinioned or brailed. The enclosures are ideal for Tragopans, Monals, and Eared Pheasants, all of which do better in large pens.

Over forty medium-sized movable pens are also in use both for breeding pairs and growing stock. They are 20 ft. long by 10 ft. wide by 4 ft. 6 in. high with light sloping shelters fixed inside. Many kinds of pheasants and other game-birds do well in these pens which can easily be moved by four men. The birds can thus receive fresh grazing regularly—an important point with a species like the Common Koklass which needs fresh green food to keep it healthy. It has been noted that Koklass Pheasants kept in these pens will not eat the fruit mixture which many species receive daily, as long as they have any grass left. When their pen is first moved the birds can be watched grazing eagerly and they crop the grass almost as short as geese.

The third type of movable pen is the "Whitlock" fold, well known on most game farms. This fold is quite small, 10 ft. long by 6 ft. wide by 4 ft. 6 in. high and is easily moved by two people. All the true pheasants and some other forms breed well in these pens which should be moved daily. The Trust uses them mainly for breeding pairs of quail and francolin and also for rearing growing stock.

Three types of heated winter quarters are in use for tropical and less hardy species. The first of these consists of a well insulated house divided into pens each 10 ft. by 6 ft. and with an outside run attached to each pen. The birds are shut in at night during the winter and an

infra-red lamp is hung over the perches for warmth. The second house is a converted broiler house 80 ft. long by 19 ft. wide divided into pens each 10 ft. by 6 ft. down both sides of the house which is warmed by oil heaters. In addition, six small individual huts each 8 ft. by 4 ft. and with an outside run attached, are in use for wintering certain species of partridges, francolins, and quail. Each hut is fitted with electric infra-red heaters.

All the birds in the collection receive a basic diet of Blue Cross poultry food and corn. The pheasants are all fed pellets containing a blackhead preventive and a daily ration of wheat; in addition, many species have a daily allowance of chopped fruit, minced beef, maggots, and mealworms.

The eggs of some of the commoner species are hatched in electric incubators but all those of the rarer forms are hatched under broody bantams. All quail eggs are hatched in incubators.

When the chicks are dry they are transferred with the bantam to an electrically heated coop with run attached. After a few days the bantam is removed. The chicks are reared on turkey starter crumbs containing a blackhead preventive. This is also the basic diet of the breeding quail and francolins. In some cases the chicks are given grated hard-boiled yolk of egg, chopped lettuce, mealworms, and maggots in addition.

Disease has not, fortunately, been a major problem; odd losses have occurred from the following:—

Enteritis
 Pasturella pseudotuberculosis
 Sinusitis
 Aspergillosis

The birds in the collection are cared for by the Director's staff at no cost to the Trust.

Leckford

The old-established collection of pheasants at Leckford has been dispersed. Through the kindness and co-operation of the Curator, Mr. Terry Jones, the Trust has been able to secure the entire breeding stocks of the following species:—

Temminck's Tragopan
 Mikado Pheasant
 Edwards's Pheasant
 Brown Eared Pheasant

The cost of this purchase has been met partly from Trust funds and also by generous donations by the following members:—

Miss Kay Bonner	Mr. Fred Johnson
Mr. A. A. Prestwich	Mr. Newton Steel

The acquisition of these birds is perhaps the most important step to date in the Trust's career. The stock of Mikados, Edwards's, and Temminck's Tragopans kept at Leckford has for many years provided the bulk of these species to be found in the world's collections today. Your Council is most grateful to all those who have made this purchase possible.

In order to safeguard these rare birds from possible destruction from diseases such as fowl pest, it has been decided to disperse breeding pairs about the country under the care of members with suitable accommodation. The birds themselves, and any progeny reared, will remain the property of the Trust.

The following is a list of birds in the collection at 1st December, 1960, and includes those purchased from Leckford :—

	M.	F.	Total.
Satyr Tragopan (<i>Tragopan satyra</i>)	1	1	2
Temminck's Tragopan (<i>Tragopan temmincki</i>)	6	7	13
Cabot's Tragopan (<i>Tragopan caboti</i>)	2	2	4
Common Koklass (<i>Pucrasia m. macrolopha</i>)	1	1	2
Himalayan Monal (<i>Lophophorus impeyanus</i>)	1	1	2
Tonkinese Red Junglefowl (<i>Gallus g. jabouillei</i>)	1	1	2
Ceylon Junglefowl (<i>Gallus lafayettei</i>)	1	1	2
Black-breasted Kalij (<i>Lophura leucomelana lathami</i>)	2	2	4
True Silver Pheasant (<i>Lophura n. nycthemera</i>)	10	7	17
Edwards's Pheasant (<i>Lophura edwardsi</i>)	5	5	10
Swinhoe's Pheasant (<i>Lophura swinhoei</i>)	7	9	16
Lesser Bornean Crested Fireback (<i>Lophura i. ignita</i>)	—	2	2
Greater Bornean Crested Fireback (<i>Lophura ignita nobilis</i>)	1	2	3
Szechuan White Eared Pheasant (<i>Crossoptilon c. crossoptilon</i>)	—	1	1
Brown Eared Pheasant (<i>Crossoptilon mantchuricum</i>)	4	4	8
Blue Eared Pheasant (<i>Crossoptilon auritum</i>)	2	3	5
Elliot's Pheasant (<i>Symaticus ellioti</i>)	1	1	2
Mikado Pheasant (<i>Symaticus mikado</i>)	5	6	11
Scintillating Copper Pheasant (<i>Symaticus soemerringi scintillans</i>)	2	4	6
Reeves's Pheasant (<i>Symaticus reevesi</i>)	10	8	18
Southern Caucasus Pheasant (<i>Phasianus c. colchicus</i>)	1	1	2
Kirghiz Pheasant (<i>Phasianus colchicus mongolicus</i>)	1	1	2
Golden Pheasant (<i>Chrysolophus pictus</i>)	6	11	17
Lady Amherst's Pheasant (<i>Chrysolophus amherstiae</i>)	6	4	10
Bornean Great Argus (<i>Argustianus argus grayi</i>)	1	1	2
Indian Peafowl (<i>Pavo cristatus</i>)	2	2	4
Black-shouldered Peafowl (<i>Pavo cristatus</i> var.)	1	—	1
Indo-Chinese Green Peafowl (<i>Pavo muticus imperator</i>)	1	2	3
Roulroul Partridge (<i>Rollulus roulroul</i>)	—	2	2
Chinese Francolin (<i>Francolinus p. pintadeanus</i>)	2	1	3
Chinese Bamboo Partridge (<i>Bambusicola t. thoracica</i>)	2	2	4
Formosan Bamboo Partridge (<i>Bambusicola thoracica sonorivox</i>)	—	1	1
Bornean Tree Partridge (<i>Arborophila hyperythra</i>)	3	1	4
Stone Partridge (<i>Ptilopachus petrosus</i>)	1	1	2
Himalayan Chukor (<i>Alectoris graeca chukar</i>)	2	1	3
Chinese Painted Quail (<i>Excalfactoria chinensis</i>)	2	2	4
Jungle Bush Quail (<i>Perdica asiatica</i>)	—	1	1
Californian Quail (<i>Lophortyx c. californica</i>)	7	7	14
Bobwhite Quail (<i>Colinus virginianus</i>)	41	42	83
	<hr/>	<hr/>	<hr/>
	141	151	292
	<hr/>	<hr/>	<hr/>

Number of forms in the collection, 39.

PACKING GAME BIRDS FOR AIR SHIPMENT

By Dr. K. C. SEARLE (Hong Kong)

Very few importations of wild-caught pheasants have been made since the second world war. With the renewed interest in pheasant breeding, new importations are more probable and indeed are essential if some species are to avoid hopeless in-breeding. The era of air shipment for livestock is now beyond infancy and, if properly packed, newly-caught birds can reach Europe from the Far East in 48 hours. It is vital that they should be packed properly if they are to arrive undamaged. The method to be described has been found entirely successful in sending wild-caught birds from Hong Kong to England ; no losses have been incurred during shipment and the general principles of the method apply equally to Roulrouls or Argus.

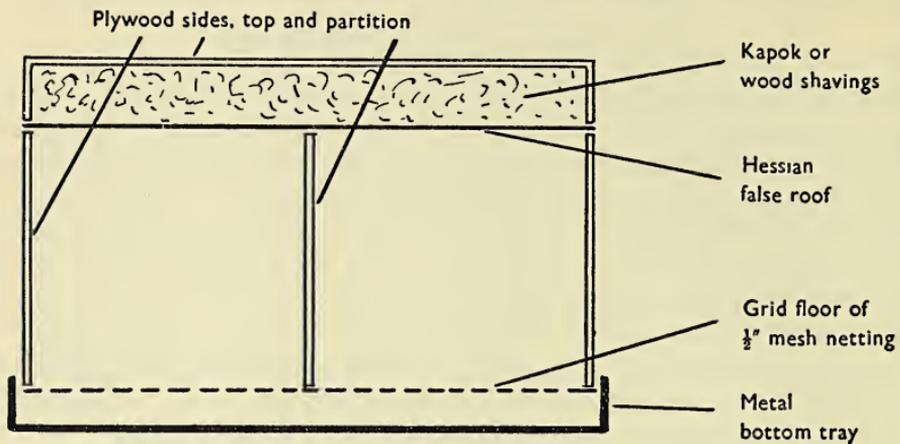
1. PROTECTION AGAINST SELF-MUTILATION

I consider this to be more important than the provision of food. Game birds are well known for their impossible wildness and only too often one sees birds scalped or maimed by their own efforts, if badly packed. Apart from padded roof and double netting the golden rules here are one bird to a compartment. *Never* pack a pair of pheasants in the same compartment or they will trample each other to death if really alarmed. Only give a bird enough room to turn round and not enough head room to jump. The ordinary roof of hessian or similar material is useless for an air journey of any length. Space in aircraft is limited and utilized to the maximum and someone, not realizing the function of a sacking roof, will lash another crate on top. This can be obviated by making a false roof of sacking 2 inches below the plywood roof—the intervening space is filled with kapok or fine wood shavings. Pheasants or partridges confined in a box fronted with large mesh netting will damage beaks, ceres, and scalps by crashing into the netting when frightened. Boxes should be fronted with a double layer of netting ; the outside layer is ordinary $\frac{1}{2}$ inch mesh but the inner layer, with which the bird makes contact, is of wire gauze. The front can be half screened with muslin for highly nervous birds ; Argus and Tragopans are usually sensible but I consider a screen essential for Firebacks, Jungle-Fowl, and Roulrouls. Apart from the front, the box is made of light plywood, the roof being padded as described and the floor of netting with a tin bottom beneath this.

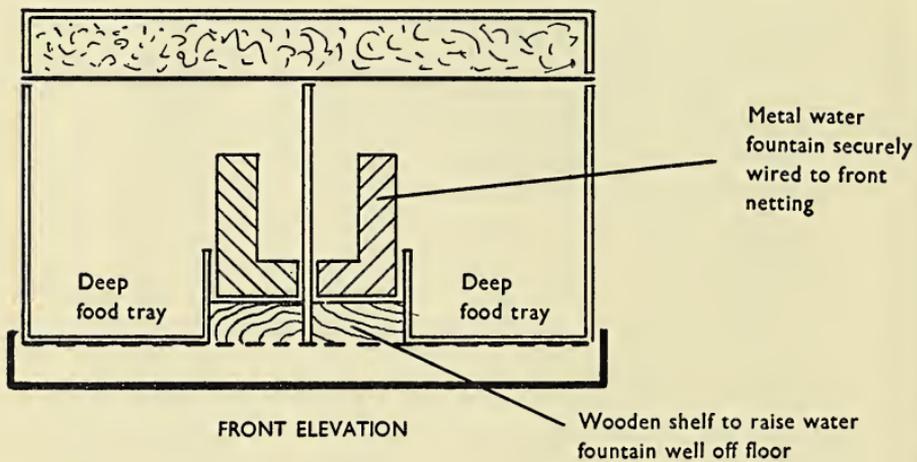
2. ADEQUATE FOOD AND WATER SUPPLY

Enough food and water is packed in each compartment for a five-day journey ; the less interference with the crates the less alarmed are the birds. Water is supplied in metal reservoir fountain drinkers but these must be securely lashed in position with wire and should be

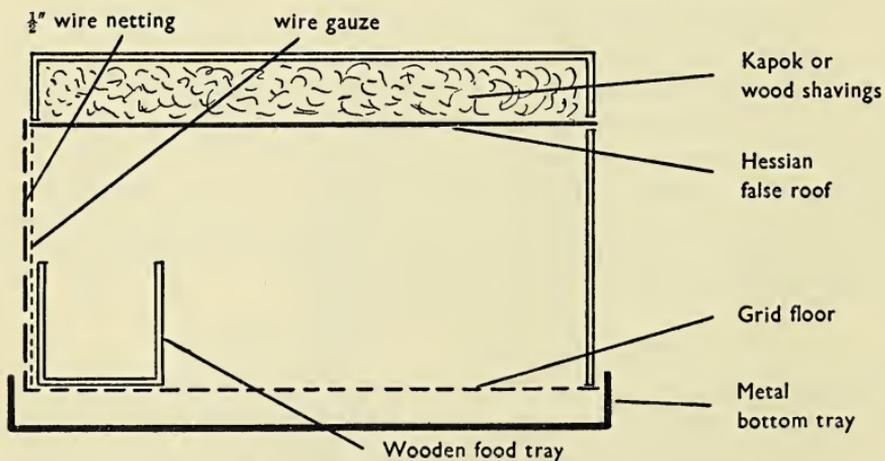
TYPE OF BOX FOR TRAGOPANS



BACK ELEVATION



FRONT ELEVATION



SIDE ELEVATION

raised off the floor on a wooden shelf. Food is supplied in a deep wooden trough, the construction of which is an integral part of the box. Food and water supplied in this manner cannot be knocked over, spilled, or easily soiled. Instructions must be supplied for further servicing of the birds if they are delayed *en route*, but such is the speed of air freightage that three days will see the birds safely delivered from Hong Kong to quarantine quarters in the United Kingdom.

3. PREVENTION OF SOILING

Reference has already been made to this aspect in considering the type of food and water utensils. Of equal value is a grid floor of $\frac{1}{2}$ inch wire netting. The jolting of aircraft on landing, etc., will spill water from any type of container and provision of a false bottom ensures that the birds remain dry. Scattered food and fæces are also out of contact with the bird.

4. ADEQUATE VENTILATION

To avoid alarming the birds only the front of the box admits light and with highly nervous birds even this is partially screened with muslin. Stuffiness is avoided by the provision of air holes along side and back.

5. LABELLING

In addition to such obvious matters as the name of the consignee (there will be an air freight bill), clear instructions must be provided for feeding and watering if delayed beyond five days, which end of the crate should be stowed facing the light in the aircraft, and bold admonitions to avoid delay.

The type of box used for a pair of Tragopans is shown in the accompanying sketch. *Inside* measurements, i.e. the area occupied by the bird and food containers, are 16 by 10 by 9 inches (high) for each compartment. Dimensions will obviously vary with the species concerned and the number of compartments can be varied to meet requirements. For ease in handling and stowing no more than three compartments to each crate is advised ; partridges are usually packed in four-compartment boxes—two behind two. The dimensions of each compartment used for various species is as follows :—

Argus : male, 23 by 14 by 12 inches (high) ; female, 23 by 12 by 12 inches (high).

Crested Fireback : 16 by 10 by 12 inches (high).

Roulrouls or other small partridges : 9 by 9 by 6 inches (high).

Removable doors are made in the back of each compartment and these are nailed or screwed down when once the occupant has been run in. If the birds are kept in holding cages with pull-up doors of adequate size they can be packed without the upset of being handled.

Once the birds are crated no further adjustments can be made inside the box ; all food, water, etc., must therefore be inside the container. The *last* step is the introduction of the bird. If tail feathers, e.g. in Argus, need trimming this can usually be achieved with a little care when the bird has entered the box and the feathers are protruding through the packing door.

Finally, it should be emphasized that birds must not be shipped unless in good condition. I like to hold all birds for at least one month before shipment. A varied and adequate diet to repair the emaciation of previous mishandling and a prophylactic course of antibiotics and soluble vitamins given in the drinking water assure that a bird is fit to stand the stresses of shipment, quarantine, and removal to permanent quarters.

* * *

THE AMERICAN QUAILS (Tribe Odontophorini)

By J. DELACOUR (New York, U.S.A.)

Although the American quails have been separated by many authors in a special subfamily of the family Phasianidae, it seems more logical to consider them as a mere tribe of the subfamily Phasianinae, which includes also the Old World quails, partridges, and pheasants. The guineafowls and the turkeys are better considered as forming two other subfamilies, Numidinae and Meleagridinae, as the differences between them and the other game birds are more important. Farther removed yet are the Australasian Mound-builders (Megapodiidae) and the tropical American Curassows and Guans (Cracidae), two distinct families of game birds.

The American quails are generally similar to the Old World quails and partridges, only possessing a stronger bill, the tip and edges of which are sharp and serrated. There are some thirty-five species, belonging to six genera, and they occur in the United States (one species barely reaches Canada in southern Ontario), through Mexico, Cuba, Central and South America, one genus reaching south as far as Peru, Bolivia, Paraguay, and southern Brazil. The south-western United States and Mexico are their strongholds. All live under cover, in forest, on wooded slopes and plains, or even in desert brush, and a number are adapted to life at high altitude, as far as trees and bushes will grow. The majority of them roost at night on trees and shrubs, and all nest on the ground, laying numerous plain or spotted eggs, pointed in shape like those of guineafowls and turkeys.

American quails never show gaudy colours ; they are usually brown or grey elaborately and brightly marked and spotted with buff, yellow, chestnut, white, and black, particularly on the head, throat, neck,

and underparts, and some are very beautiful. They have a short body and a fairly long, broad tail with a few exceptions of very short tailed birds. The head is often tufted or crested. The legs are moderate in length and do not possess spurs. The sexes are more or less different, sometimes similar.

American quails are excellent game birds, particularly those of the open woodlands and scrub of the United States and Mexico. But they require certain conditions to prosper. They are found, as a rule, on rocky, sandy, or, at the least, light soil and they are intolerant of stagnant humidity, heavy, soggy ground, and wet grass. None has so far been successfully introduced into Europe, but the California Quail is to-day well acclimatized and numerous in British Columbia, Washington, Oregon, the Rocky Mountain states, New Zealand, Chile, and the Hawaiian Islands; so is the Bobwhite in the western United States and south-western Canada. They do well in captivity on sandy soil, or on wire netting and concrete floors. They soon perish on moist, heavy soil. They are inclined to breed in confinement. It is necessary to isolate breeding pairs, which can, however, be associated with various passerine birds. They bother doves and pheasants, and often prove aggressive toward other game birds. Grain and green food constitute their main diet, to which high protein pellets, hard-boiled egg, ground meat, and insects are added during the breeding season. The chicks are usually easy to rear with the same care and diet as other quails. The pairs take good care of their young, but it is often safer and easier to hatch the eggs in an incubator and to rear the chicks in a brooder. The incubation period is between twenty-one and twenty-four days.

American quails form six genera, well defined by their shape and proportions, colour pattern, and life habits.

I. WOOD PARTRIDGES (*Dendrotyx*)

These large Wood Partridges are characterized by their long tail, small but strong bill, and rather small legs and feet. The feathers of the crown are long and form a short occipital crest. They are rare and confined to the mountain cloud forests of southern Mexico and Central America. Three species and about eight subspecies are known. Their plumage is rather sombre but well marked: upper parts olive or rufescent brown, spotted, streaked with black, the hind neck striped with chestnut; underparts olive-grey, more or less streaked with chestnut, whitish or dusky black; head with crown feathers elongated and forming a short crest when erected; throat black, grey, or white; bill, bare skin around the eyes and legs red. Sexes alike.

The BEARDED WOOD PARTRIDGE (*D. barbatus*) inhabits the mountains of the State of Vera Cruz and is characterized by its grey chin and throat, and its uniformly chestnut breast.

The LONG-TAILED WOOD PARTRIDGE (*Dendrortyx macrourus*) has the chin and throat black, and a grey breast streaked with blackish brown. The five subspecies are found throughout the mountains of central southern Mexico: *D. m. macrourus* (Vera Cruz); *griseipectus* (Morelos); *diversus* (Jalisco); *striatus* (western Jalisco to Michoacan); *oaxacae* (Oaxaca).

The WHITE-THROATED LONG-TAILED PARTRIDGE (*D. leucophrys*) has white chin and throat. It is confined to the highlands of Central America: *leucophrys* (Guatemala); *nicaraguae* (Honduras and Nicaragua); *hypospodius* (Costa Rica).

These large American quails have not been kept in captivity to our knowledge. It is due to the difficulty of obtaining them in their native mountain forests. Very little is known of their life habits.

II. WESTERN QUAILS (*Callipepla*)

The six species of quails found in the western United States and in Mexico are among the most attractive, therefore the most frequently kept and bred in captivity. Although usually divided into four genera, three of them with only one species each (monotypic), the great similarity in their general proportions, colour-pattern, voice, and habits makes it advisable to include them all in the genus *Callipepla* Wagler 1832. The genera *Oreortyx* (*picta*), *Lophortyx* (*californica*, *gambeli*, *douglasi*), and *Philortyx* (*fasciata*) are therefore considered synonyms of *Callipepla*.

All Western quails have a short bill, a crest on the occiput, moderately long legs, and a fairly long, broad, flat tail. The bill and legs are black or dark brown. They all lay large clutches of eggs.

PLUMED QUAIL (*Callipepla picta*)

The largest of the Western quails, almost the size of a Grey Partridge, and the handsomest of all. Tail rather short and almost square; legs fairly short; long toes; a long upright crest of two narrow black feathers. The sexes are alike, the female only slightly smaller and duller. Crown, sides, back of neck and breast grey; forehead and chin white or buffy; cheeks black, throat rich chestnut, surrounded by a white line; upper parts olive-brown; sides chestnut with broad white bars; flanks reddish brown; belly pale brown; under tail-coverts black; iris brown. Young birds are brownish, the juvenal plumage being worn only a short time; downy chicks boldly marked with buff and chestnut. Eggs cream to pinkish buff, unspotted, ten to twelve in a clutch.

Plumed Quails inhabit forested mountains and chapparal covered slopes. They are particularly fond of clearings where bushes have been growing. They live mostly on the ground, nesting and usually roosting on it. They seldom perch on trees, mostly when frightened. They remain under cover and do not flush easily; they are, therefore, not

easy to hunt and, although their flesh is excellent, they are not highly regarded as game birds.

The species is divided into five subspecies, which differ only slightly in the depth of their colours, and are of little interest for the aviculturist. Its range consists of the mountainous parts of California, the adjoining states (Oregon, Washington, western Nevada), and Baja California. They are found at fairly low altitudes in the north, but above 2,000 feet elsewhere, and up to 9,000 feet; all, however, descend under 5,000 feet from September to April.

Plumed Quails are extremely elegant birds, much appreciated in captivity. But they are not very easy to keep. Like many other highland birds, they are intolerant of dampness and heavy soil, as well as susceptible to germs. They do well in dry, sandy, or rocky districts; elsewhere they must be kept on concrete floors or on wire netting. The young are rather delicate and need great care; they require the normal diet of other young quails.

CALIFORNIA QUAIL (*Callipepla californica*)

This is a common species, the best known in captivity of the group. Considerably smaller than the Plumed Quail, it differs not only in shape and colour, but also in the fact that the sexes are different. The male has a fairly long crest of spatulate feathers held forward toward the bill; forehead white streaked with grey; eyebrows white; crown dark brown; throat black bordered with a wide white line; sides and back of neck black spotted with pale grey; upper parts olive-brown; the tail long and broad, dark grey; wing like the back, the tertiaries with broad buff lines; flanks brown, lined with white; breast grey; rest of underparts laced with black, the middle of the upper belly yellowish buff, passing to chestnut on the abdomen. The female has a shorter crest, no black or white on the head, which is brown; the throat is lined with whitish, the sides and back of neck finely spotted, the breast brown like the rest of the upper parts; abdomen white laced with black. The first plumage of the young is duller; the chicks are marked chestnut brown and buff, the eggs mottled with brown, resembling miniature turkey eggs.

California Quails constitute the most popular game bird of the Pacific Coast, although they are rather reluctant to fly. They were incredibly numerous when the country was first settled, and there still are many at present. They live in the valleys and on mountain slopes, up to 4,000 to 5,000 feet, wherever there is enough brush, exceptionally higher, feeding mostly on seeds and leaves, to which they add insects, particularly in the breeding season. They live in flocks, except during the breeding season when they separate in pairs. They lay large clutches, up to twenty eggs, but the broods are often decimated by predators.

These quails adapt themselves readily to human settlement and are found in gardens and orchards ; but they remain wary and wild. Their voice is attractive and varied, their full call being : “ who are you ? ”

There are several, not very different subspecies, varying only slightly in size and depth of colour. The nominal race extends to practically the whole of the coast and mountains of California except the northern coastal area from the border of Oregon to Monterey (*brunnescens*). They occasionally meet Gambel's Quails on the edge of the desert, and more often Plumed Quails on the mountains. Santa Catalina Island has a larger race, and Baja California greyer ones.

California Quails have been successfully introduced into British Columbia, Washington, Oregon, Utah, Arizona, New Mexico, the Hawaiian Islands, New Zealand, and Chile. They are very popular in captivity and very easy to keep and to rear if dampness and heavy soil are avoided.

GAMBEL'S QUAIL (*Callipepla gambeli*)

This desert quail much resembles the California Quail, having the same size and shape. It differs only slightly in plumage. The male is of a lighter colour generally ; it has the crown chestnut, instead of dark brown, the sides and back of the neck light grey streaked with chestnut, the upper parts and breast of a paler tone of brown and grey, and no lacing ; the upper abdomen is plain buff with the centre black ; the sides are deep chestnut lined with white. The female differs in the same way, being a more uniform grey, with plain buffy underparts and chestnut and white sides ; the neck and throat are less strongly marked. Young chicks much as in the California species ; eggs similar, with darker markings.

Gambel's are the quails of the south-western desert, and they are found, often in large numbers, wherever there is water, as they must drink every day. On the border of the coastal ranges and the desert they meet California Quails, and hybrids occur. They are partial to mesquite and other desert brush. Both species are similar in life habits if the difference in habitats are taken into account. Their voices are only slightly different.

Gambel's Quails are abundant in suitable localities, but their number varies greatly, from year to year, according to the rains. They are found in south-western Utah, southern Nevada, Colorado and New Mexico, south-western Texas, Arizona, California, east of the coastal mountains, Baja California, and north-western Mexico. They do well in captivity if protected from humidity.

DOUGLAS' QUAIL (*Callipepla douglasi*)

Douglas', or Elegant Quail, resembles in general proportions and shape the California Quail although it has a thicker bill, shorter legs

and tail. The crest is held backwards and the sexes are different. The male has the head and throat spotted black and greyish-white ; crest orange cinnamon ; nape and hind neck grey spotted with chestnut ; back grey, wing-coverts and tertiaries chestnut striped with white ; tail grey ; breast grey becoming spotted with white, the spots large on the abdomen ; sides marked with chestnut and spotted with white. The female is duller, with a shorter, sooty-brown crest ; top of the head, hind neck and mantle dusky brown streaked and spotted with buffy white, wings spotted brown and black, with buff lines ; rump greyish brown ; underparts brown spotted and striped with white, the throat streaked white and black.

Douglas' Quails inhabit the low, dry western districts of Mexico from Sonora and Chihuahua to Jalisco. The northern subspecies (*bensoni*) (from northern Sonora) is paler, with a black throat and a paler breast. It is the most often seen in captivity. A darker and smaller race (*teres*) is found in Jalisco, and another one (*impedita*) from Nayarit ; a browner one (*languens*) inhabits western Chihuahua. They frequent the dense brush of the tropical foothills, particularly the thick second growth of cut-over forest, roosting a few feet above the ground. They resemble otherwise the preceding species in behaviour. They do well in captivity and have often been reared in Europe and in America.

SCALED QUAIL (*Callipepla squamata*)

This bird, often called the Blue Quail, differs from the preceding species in its shorter, much broader, and thicker crest, the fluffy feathers of which are slightly arched backwards ; the tail is rather short and well rounded. The sexes are similar, the female only smaller and slightly duller than the male. They are not as brightly coloured as the quails mentioned so far : head and neck plain brownish grey ; the crest feathers largely dull white ; upper back and breast bluish-grey, laced with black, producing a scaly effect ; rest of upperparts brownish-grey, the tertiaries with white bars ; belly yellowish, laced with black (ochraceous and rusty chestnut in eastern race *castaneo-gastris*) ; sides grey with large elongated white patches and brownish border. Juvenals duller, and chicks chestnut and buffy, greyish underneath. Eggs white, very lightly marked with cinnamon buff.

Scaled Quails live in the dry canyons, plateaux, and plains with grass, scattered trees, and bushes which are found between the mountains of the highlands of the great arid interior of northern Mexico and the south-western United States. They are met with in pairs or covey, running among cacti and other desert vegetation, sometimes with Gambel's Quails. They nest under bushes, in June or July, when rains are occurring. They come to cultivated grounds when not too much disturbed. They seem to eat more insects than other

species. They are terrestrial birds, with powerful legs, and they do not often fly. They travel far to water, but often bathe in sand. Their voice is a long-repeated "chip-chior". They are hard to hunt and not too much appreciated as game birds. They are widespread, but never very abundant, and sedentary.

The western, paler race (*pallida*) occurs in southern Arizona, east central Colorado, just reaching Oklahoma and Kansas, Texas, east to 100 degrees L., north-western and central northern Mexico; a better coloured race (*castanogastris*) lives in south-eastern Texas and north-eastern Mexico, while the nominal race *squamata* inhabits Mexico from southern Coahuila, Chihuahua, and Sonora to Mexico City. They are easy to keep and to rear in captivity if protected from humidity.

BANDED QUAIL (*Callipepla fasciata*)

A small quail, with a short, thick bill, a crest with four long, narrow, black feathers tipped with chestnut, and a fairly long, almost square tail; brown above, the scapulars and tertiaries spotted with sooty-black and barred with pale buff; back and tail brown speckled with grey and barred with buff; throat greyish white; upper breast buffy brown; rest of underparts regularly barred black and white, the breast and sides brownish. Sexes similar. The immature has the throat black.

This little quail lives on the open, bushy highlands of south-western Mexico (Colima, Michoacan, Guerrero, Morelos, and Puebla), where it is resident. Although more closely related to the other Western Quail, it recalls the Bobwhites in certain habits, preferring to live in dense weed patches, and roosting on the ground. It is often found near cultivation, up to 5,000 feet, but is more numerous at lower altitudes. It breeds mostly in August. Its staple diet is seeds.

Although they do well in captivity, these pretty quails are not often kept and I can find no record of their breeding.

(*To be continued*)

* * *

THE CARE AND BREEDING OF THE SATYR TRAGOPAN

(*Tragopan satyra*)

By F. E. B. JOHNSON (Bletchley, Bucks, England)

It is hard to say which is the most beautiful of the five species of tragopans, beauty always being a matter of personal opinion. Certainly the carmine red of the Satyr's breast is not surpassed in brilliance by the colour of any of the others. A full description of all five species is to be found in Delacour's *Pheasants of the World*, but mention can be made of one or two further features of great beauty: the small white spots, each surrounded by a black ring, which are distributed over almost the whole of the plumage, and the large olive-brown ocelli which are apparent on the wing-coverts, back and rump.

The Satyr Tragopan is a much larger bird than the more familiar Temminck's Tragopan and the male of the former species is much larger in proportion to the female than is the case with Temminck's.

The Satyr Tragopan is found in the wild in the Himalayas in dense mountain woods and its range extends from a point west of Nepal eastwards to a point east of Bhutan. As in the case of most other pheasants, this is not really a very wide range, particularly when one considers its limited habitat and the continued encroachment of civilization on the mountain forests.

Although Satyr Tragopans have been bred regularly in captivity since the close of the last century, there have been very few in England since the last war and to the best of my knowledge there are less than a dozen in the British Isles at the present time.

All tragopans require plenty of space. They must have sufficient exercise and will keep in much better condition if they are able to find insects and leaves to their liking in their aviary. My adult pair is housed in an aviary approximately 40 ft. \times 21 ft. \times 5½ ft. high with, at one end, a shed open at the front. Like other pheasants they never roost in it but it gives them a chance to get dry in the daytime after it has rained or snowed all night. The aviary should be well planted with shrubs and have an area of grass kept short.

My adult birds are fed as follows:—

Morning: Two to three handfuls of "Turkey Breeders Pellets" mixed crumbly with skim milk, plus half an apple per bird (or other fruit in season). Elderberries, blackberries, tomatoes, and snowberries (*Symphoricarpus alba*) are particularly appreciated.

Afternoon: One handful of wheat which has previously been soaked for twelve hours (then rinsed clean, of course). The above quantities are for a pair of birds.

Young tragopans need more careful feeding than many other pheasants but are not difficult to rear. They usually start feeding by eating finely chopped pieces of lettuce leaf or hard-boiled yolk of egg. These items should be scattered over a portion of "Turkey Starter" or "Pheasant Rearing" crumbs mixed crumbly with skim milk. Mealworms should also be given and I have found Satyrs more partial to these than are Temminck's. At roughly three months of age the young tragopans can be changed gradually from a starter to a "Turkey Rearing" pellet and then at five months or so on to the adult diet. The yolk of egg can be discontinued at the age of two weeks but lettuce or other tender leaves should be given until the birds are known to be eating grass. Fruit should be introduced when blackberries are available in September.

My method of hatching and rearing is the same as I have described for *T. temmincki* (*Avi. Mag.*, Nov.—Dec., 1959).

Generally speaking I found the Satyrs as easy to hatch and rear as Temminck's. My pair of Satyrs was very prolific, the hen laid twelve eggs, all in a nest on the ground in a clump of nettles, and every one was fertile and hatched. Two of the chicks died before being moved to the rearing coop and eight of the remainder were fully reared and still survive. Needless to say the twelve eggs were incubated in five different clutches.

The chick in down is distinguishable from *temmincki* by a noticeable lack of "stop" at the base of the upper mandible. The newly-hatched Satyrs are slightly larger than Temminck's and more "ginger" in colouring.

The sexes can be distinguished at about three months of age by the markedly darker colouring and finer vermiculations of the plumage of the males. This is confirmed later by the appearance of red and black on neck and head.

Some "do's" and "don't's" with Satyr Tragopans :—

1. Do provide plenty of shade.
2. Don't take the bantam foster mother away from the young until they are larger than she is.
3. Do provide fruit for the adults all the year round.
4. Don't overfeed the birds with corn.
5. Do remember that if there is not grass available all the time ; they must be given tender green food.

Satyr Tragopans are one of the most beautiful of all birds and are tame and confident with those who feed them. While they are not, probably, in such imminent danger of extinction as several other pheasants it is, nevertheless, very advisable to build up and maintain a stock in this country while the opportunity is still with us.

SOME ABERRANT PLUMAGES IN THE COVERT PHEASANT

(*Phasianus colchicus* Linnaeus)

By Dr. JAMES M. HARRISON (Sevenoaks, Kent, England)

Abnormal plumages in the covert pheasant, *Phasianus colchicus* Linnaeus, are well known and it has been thought that an account of these and their causes, to the best of our present-day knowledge, would not be out of place.

The covert pheasant is very prone to develop aberrant plumages quite apart from the observable individual variations which depend upon the very mixed genetic origin of this bird. This latter circumstance has tended to produce what might be termed an average type, in which the various strains in its inheritance can be recognized as blended, but it can also produce individuals which in their morphology incline very strongly to some particular race, e.g. towards the extremely pale Far Eastern forms *P.c. satscheuensis* or *P.c. formosana*, while the close resemblance of the Melanistic Mutant Pheasant, *P.c.* var. *tenebrosus* to the Japanese species *P. versicolor* is a very striking instance. In other words, the individual variation of any individual may be along the lines in which the racial characters form a mosaic or come to resemble strongly one of the more extreme geographical forms.

This proneness to vary is favoured by the fact that our covert birds must be recognized as rather in-bred, while it is equally true that gallinaceous birds generally seem particularly liable to abnormalities of one sort and another.

The gene complexity of the covert pheasant since its introduction into Britain by the Romans has been greatly increased by the introduction subsequently of many different races and, in consequence of this, by gene recombination a great variety of individuals showing combinations of characters of their widely different ancestry are seen.

Apart from the above, in which we can detect what one may describe as the normal genetic variation of the species, certain more strikingly discontinuous variations are met with and it is possible to make the following broad classification of such aberrations in accordance with their believed causations.

I. GENETIC

Under this heading may be mentioned pied individuals, or even a state of total albinism including the irides or soft parts. This is regarded as due to the recombination of recessive genes and can be perpetuated by selective breeding. The pied state when affecting iridescent parts such as the head and neck results in a leucistic or greyish colour.

The most striking example of a spontaneous mutation is, of course, the Melanistic Mutant Pheasant, in which the hens and chicks are also melanistic while a partial transient pied condition in the chicks is of particular interest. This form also breeds true.

The other notable mutation of the species is that known as the "Bohemian Pheasant". In this variety the rich golden-red ground colour of the cocks is replaced by a buffy-yellow colour, the feathers being picked out in blackish, the result being a very handsome bird. By selective breeding the stock can be maintained.

2. GYNANDROMORPHISM

The condition of gynandromorphism in which an individual is female as to one half of the body and male as to the other, the division being in the long axis, has been met with in some finches and also in the domestic fowl as well as in the pheasant.

It is at once clear from the more or less sharp division of the two sides of the bird that this condition does not depend upon the influence of hormones circulating in the blood and that some other explanation is necessary. The most generally accepted theory is that which postulates the loss of a sex chromosome at a very early division of the nuclei. A further cause for the gynandromorphic individual is that of a maldistribution of the somatic (body as distinct from the sex) chromosomes which carry nuclei in excess of the normal numbers.

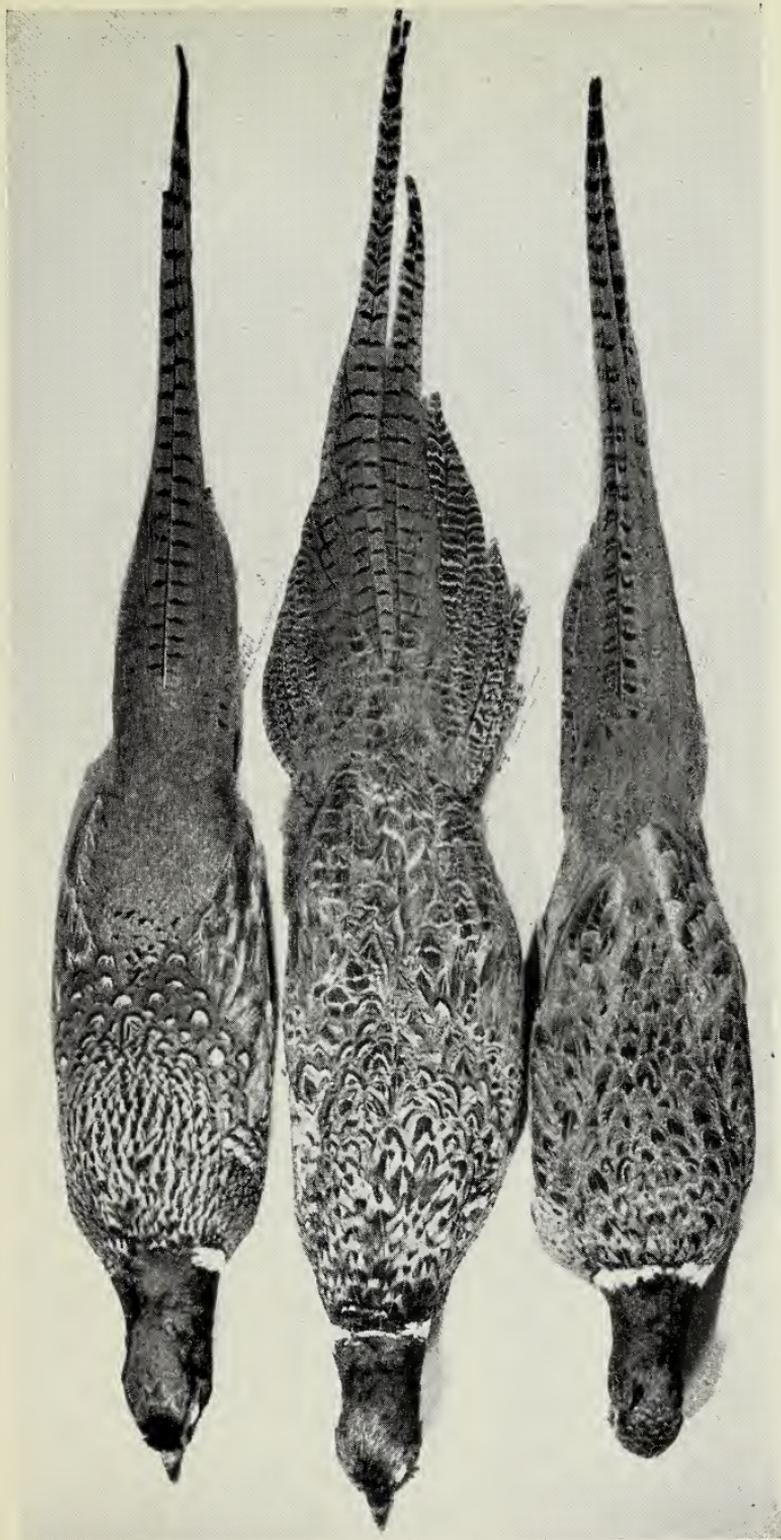
Such a case in a pheasant was described by C. J. Bond¹ and in the course of time was reassessed by Huxley and Bond² in the light of some recent research in which it was shown that not only was there the striking plumage differences but that there was also a size difference, the male half of the bird being larger than the female half as determined by accurate measurements of the skeletal components. These differentials of growth rates and size were disclosed by the brilliant researches of four scientists—Juhn, Faulkner and Gustavson³ and Lillie.⁴

A gynandromorphic mosaic as distinct from a true mid-line division into a half male and half female individual can result from a hormonal influence and need not necessarily depend solely upon the presence or absence of the respective sex hormones and this is discussed in the next section.

The differential growth rate referred to above in cases of true gynandromorphism also occurs in the individual feathers for in Bond's pheasant referred to above one half of the tail feathers, the male half, grew faster than the female half and, in consequence, the feather was curved outwards instead of being straight.

3. ABERRATIONS OF SECONDARY SEXUAL CHARACTERS

In-breeding and an inherent instability of sex in birds accounts for a number of abnormalities of plumage. Much experimental work has

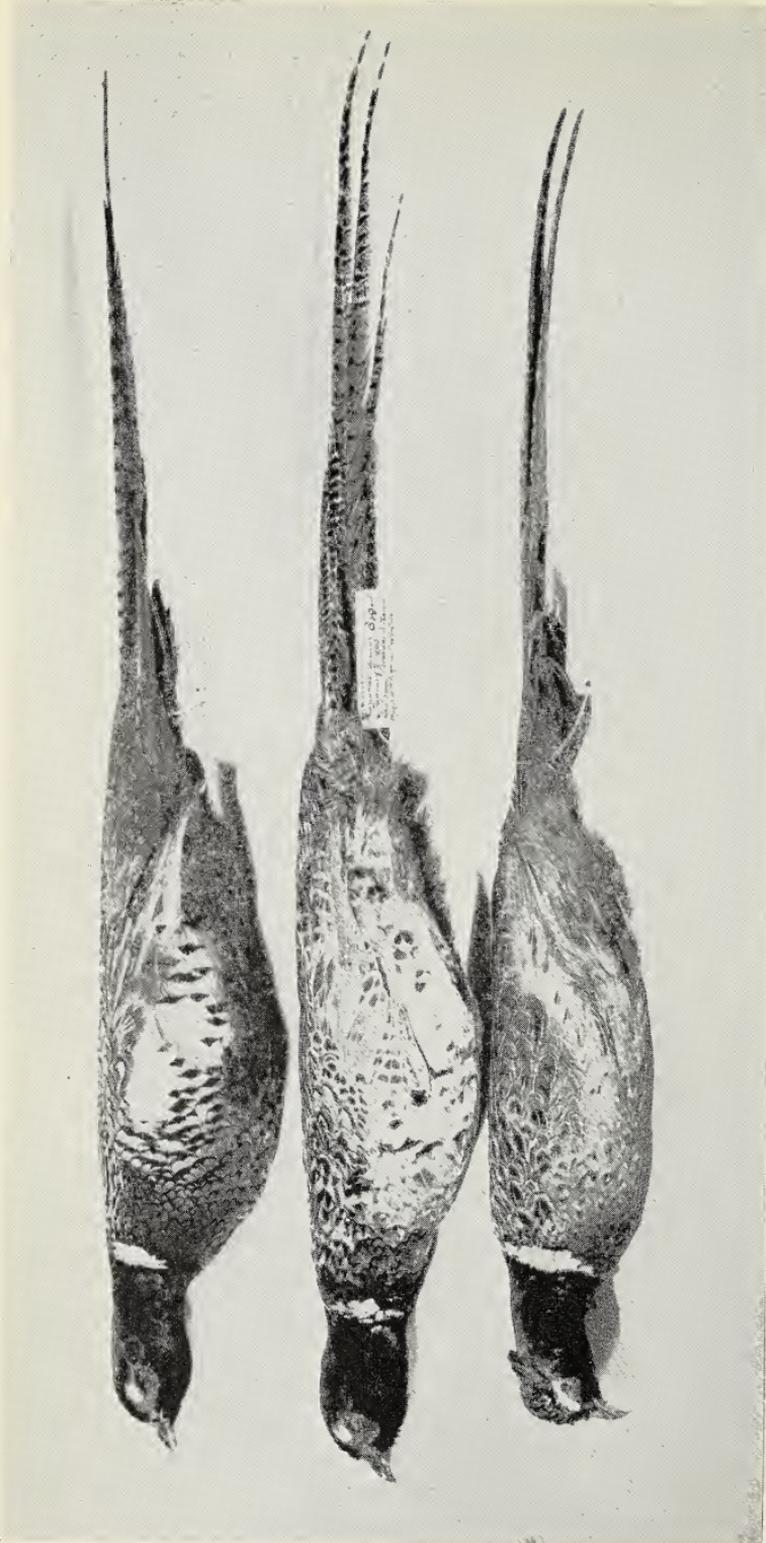


J. M. Harrison

1. ABOVE : NORMAL COCK PHEASANT.
2. CENTRE : HEN-FEATHERED COCK.
3. BELOW : COCK-FEATHERED HEN.

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J. M. Harrison



1. ABOVE : NORMAL COCK PHEASANT.
 2. CENTRE : HEN-FEATHERED COCK.
 3. BELOW : COCK-FEATHERED HEN.

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been done on this subject and the underlying principles involved are now well understood.

Certainly in the gallinaceous birds the well marked sexual dimorphism is under hormonal control, but in certain passerines the plumage of the cocks is determined genetically. It is known, e.g. that this is the case in the Gouldian Finch, *Poëphila gouldiae*, while in the familiar House-Sparrow, *Passer domesticus*, the only secondary sexual character under hormone control is the bill colour of the male in the breeding season, when testicular secretion transforms the yellowish brown bill of winter into the jet black bill of summer.

The normal action of the internal secretion of the ovary in hens, including pheasants, is to inhibit male plumage. In consequence of this when this secretion fails, whether from experimental ablation or from disease, or even just as a phasic imbalance of the endocrine system, what has been referred to as the "Bisexual nature of the hen" by Zawadowsky⁵ is seen in operation, for often in such cases a sex gland develops on the right side. In the majority of birds the ovary is a single organ situated in the left side of the abdominal cavity. The right-sided gonad which develops under the above circumstances when examined microscopically is seen to be a mixed gland containing both male and female elements and is termed an "ovo-testis". Male sex hormone is also derived from the adrenals which can add to the development of male-like plumage in such cases.

Such "cocky-hens" were known as long ago as 1780 when the famous surgeon, John Hunter, described the condition in a pheasant, indeed there is a very early couplet which runs as follows:—

"A whistling woman and a crowing hen
Are neither good for gods nor men."

The condition was attributed to disease of the ovary (tuberculosis) and also to atrophy of the ovary from old age. This, however, was only a half truth for a temporary swing from femaleness to maleness can take place in quite young birds as a result of the fluctuations in the supply of either male or female hormone.⁶ When irreversible such castrates, whether occasioned by design or disease, are invariably grossly obese and are also altered insofar as their psychology and behaviour is concerned. To the best of the writer's knowledge no case of a complete, i.e. of a functional sex reversal has ever occurred in the covert pheasant though, on theoretical grounds, there would appear to be no reason why this could not happen, for such cases are authoritatively recorded in the domestic fowl.

Cocky-hen pheasants are relatively common, while hen-feathered cocks are far less so. Superficially these two aberrations are rather similar as can be seen from the accompanying plates; also the

similarity of both secondary sexual aberrations to the average normal cock pheasant is apparent.

In origin, however, the aberrations are quite different for in the case of the "henny-cock" the condition is not determined by a failure of a sex hormone, but is brought about by the influence of the secretion of the thyroid. Such cases were produced experimentally by Zawadowsky.⁷ Briefly, an excess of thyroxine brings about two distinct modifications of plumage; the first is an accentuation of the dark feather markings resulting in an appearance of feminization, the second is a bleaching effect on the ground colour producing a further accentuation of contrast between ground colour and pattern. It is not all the feathers that undergo these changes equally, and reference to the plate shows that in effect a gynandromorphic mosaic has been produced; this is especially evident in the tail feathers, which should be compared with those of the control normal cock and the cocky-hen. It will at once be noticed that the lateral tail feathers in the henny-cock are very heavily pigmented and are in fact over-feminized.

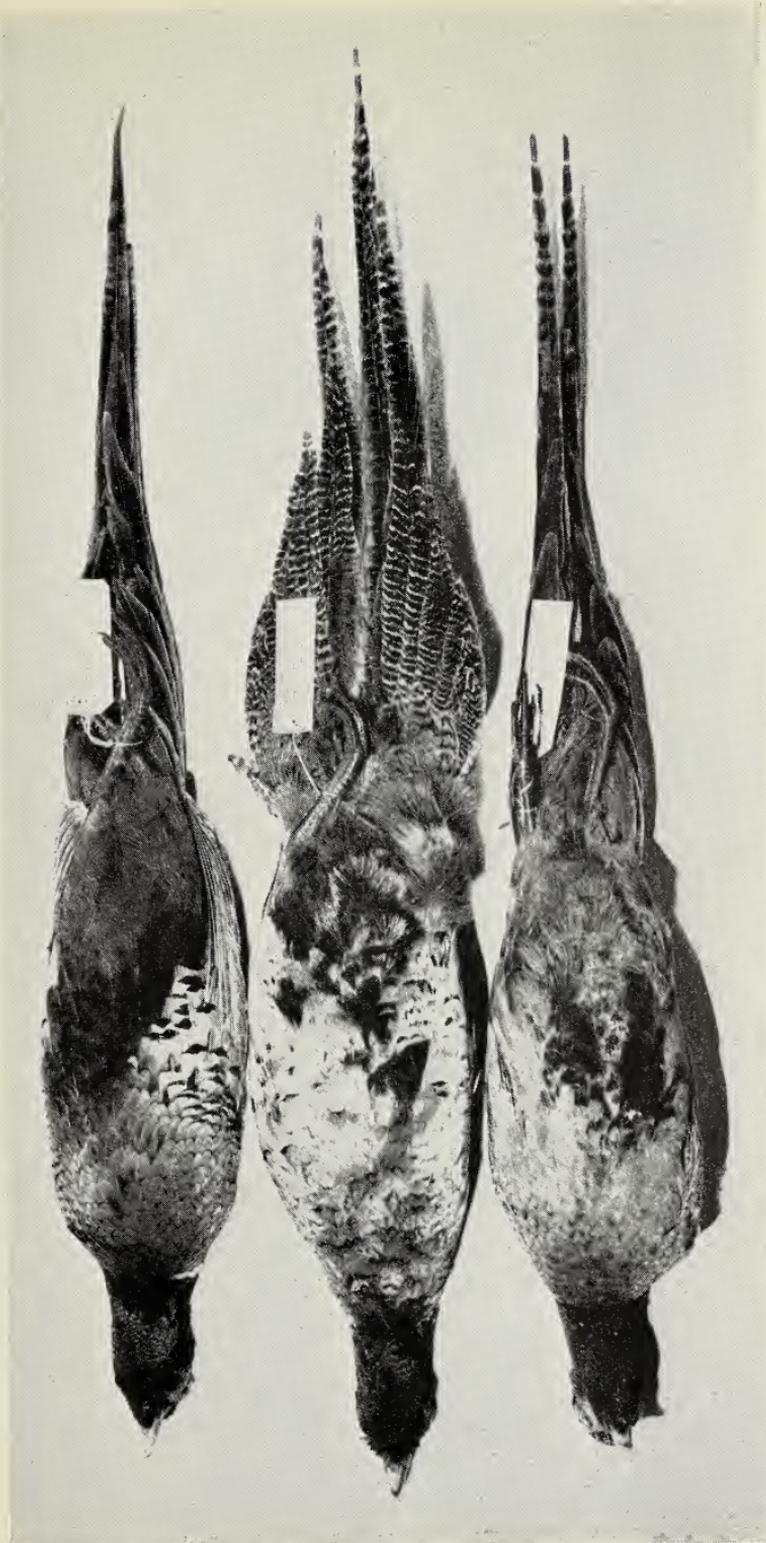
Another point of great interest is the fact that in the latter specimen in the terminal part of the central tail feathers the character is again female, even allowing for the somewhat heavier but nonetheless wider spaced barring at the end of the tail of the normal cock. In fact in the fourth left tail feather the gynandromorphic condition is even more marked. Areas predominantly male and predominantly female can be recognized and one can only conclude, on this evidence, that there has, during the course of the development of this generation of feathers, been a phasic endocrine imbalance induced by a dysfunction of the thyroid an antagonism between the thyroids and gonads.

The thyroid is known to initiate moult and the gonads to inhibit this process. The pseudo-feminization in this pheasant is the more remarkable in that not only is the feather pattern altered towards the typically female but even the shape is changed from the rather lanceolate form in the male to the blunter ovate of the female: this is particularly seen in the scapulars and on the mantles in the specimens depicted.

While we have seen that in the female pheasant with atrophy of the ovary a mixed male and female sex gland can develop on the right side, ovarian elements can also be induced in the male if the appropriate stimuli are applied very early in embryonic life. This proves that the male too has a certain bisexuality which is, however, very shortlived after which its sex is stable.

It would really seem that the answer to this curious anomaly must lie in the individual feather papillae which may possess an intrinsic bisexuality which can prove sensitive to hormone influences, being affected by the absence of female hormone to maintain a semblance

[J. M. Harrison



1. ABOVE : NORMAL COCK PHEASANT.
2. CENTRE : HEN-FEATHERED COCK.
3. BELOW : COCK-FEATHERED HEN.

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of maleness or by thyroxine (thyroid secretion) to produce a pseudo-female characterization.

It is the very marked differences in the sexual dimorphism of most birds which makes them such ideal subjects for the study of secondary sexual characters, and the covert pheasant may well be said to have made a substantial contribution towards our knowledge of cause and effect, both from the genetic and hormonal aspects, of this very interesting subject.

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* * *

PEAFOWL

By J. J. YEALLAND

There are two species of peafowl, *Pavo cristatus*, the Common or Indian Peafowl of India and Ceylon and *Pavo muticus*, the Green Peafowl of the area from Burma to Indo-China and southward to the Malay Peninsula ; also Java.

The Common Peafowl inhabits fairly open country, preferably near water, wherever there are trees in which to roost, and generally below about 3,000 feet, though ranging to higher altitudes in southern India. In places where it is held sacred it becomes tame and may congregate around human habitations, but where hunted it is wary and difficult to approach.

The food consists of various small animal life such as larvae, worms, termites, lizards, frogs, and small snakes ; also seeds and other small fruits and foliage. The male generally lives with several females, staying about a favoured area, but sometimes moving off in search of favourite fruits.

Nesting takes place on the ground, four to eight whitish or buffish-white eggs, sometimes spotted at the larger end, being the clutch and the incubation period is twenty-seven to twenty-nine days.

The white and the black-winged are colour forms of the Common Peafowl, both apparently only occurring in captivity, the latter being first mentioned by Latham in 1823. There are pied birds and a fertile hybrid between the black-winged form and the Green Peafowl is established in California where it is known as Spalding's Peafowl.

Pavo cristatus is hardy and generally stays well at liberty in parks or large gardens where there are suitable trees in which to roost. It sometimes does damage to plants, but it does find a certain amount of natural types of food when kept at liberty, though some additional food must be provided, particularly in winter. It will thrive in a large well-drained aviary that has a grassed flight and can be fed either on one of the high protein pellet foods used for domestic turkeys or on a mixture of wheat, barley, maize, and biscuit meal containing meat meal. Fruit, both fresh and dried (currants and sultanas being soaked in water overnight), and green food such as lettuce, cabbage, spinach, dandelion leaf, and lucerne should be provided. A little minced raw lean meat can be given in place of the meat-meal impregnated biscuit. Grit must naturally be provided.

The chicks can be reared on the "crumbs" used for turkey poults, for this balanced food contains some Entramin which prevents histomoniasis (blackhead) to which peafowl chicks are rather susceptible.

Peters considers *P. muticus* as one form, but Delacour enumerates three races, *P. m. spicifer*, the Burmese; *P. m. imperator*, the Indo-Chinese, and *P. m. muticus*, the Javanese, and says of them: "As far as we can ascertain today from scanty material at hand a rather dull bluish sub-species inhabits western Burma; a greener, brighter bird is found east of the Irrawaddy valley, extending to the China Sea and probably south to the Isthmus of Kra, while a still more brilliant and golden form lives in Malaya and Java."

He also says: "In habits Green Peafowl are much like Indian, but they are wilder and more wary as a rule, probably because nowhere protected by religious scruples. They are fiercer and stronger, more brusque in their actions. Locally common when suitable conditions exist and if they have not been destroyed by man, they require open spaces such as river banks, clearings, and park-like country with long grass, patches of jungles, and trees in which they can rest and hide. They shun deep unbroken forest and large open plains, being absent from the great cultivated deltas of the Irrawaddy, the Menan, the Mekong, and the Red River. Also they do not ascend mountain slopes above 4,000 feet, although numerous just below that altitude.

They are often found in small groups composed of an adult male,

a few females, and young during the spring and summer, but they gather in big flocks in autumn and winter.”

The Green Peafowl is not so hardy and should be shut in when frost is expected. Males are usually aggressive, often attacking human beings.

The diet in captivity is that advised for the Common Peafowl and for the reasons already stated, this species should be kept in a large aviary, not at liberty.

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* * *

HONEY BEE LARVAE (*Apis mellifera*, L.) FOR BIRD FOOD

By NORMAN E. GARY (Department of Entomology)

ROBERT W. FICKEN and ROBERT C. STEIN

(Laboratory of Ornithology, Cornell University, Ithaca, New York)

INTRODUCTION

Studies concerning insectivorous birds in captivity have been handicapped by the problem of obtaining adequate diets for rearing and maintaining such birds. Behavioral studies are especially dependent upon the state of health of the birds. The collection of insects from the field for bird food can be extremely time-consuming and expensive. Although insectivorous birds in nature feed on a wide array of insects, their nutritional requirements in captivity apparently may be satisfied by supplying them with a few species. According to Naether (1955), live ant eggs (pupae?) are in themselves a complete food for soft-billed birds. Such insects may be fed alone or blended with other food supplements.

Insectivorous birds obviously are adapted physiologically to the nutritional elements comprising insects. There are probably certain amino acids, trace elements, vitamins, and other growth factors, which render insects more desirable nutritionally than the most elaborate laboratory food containing a great variety of such substances. It is recognized commonly that insectivorous birds are benefited by a diet containing some living insects. Perhaps this effect is partially “psycho-somatic”.

Many factors influence the suitability of various insects for laboratory rearing. Variations in disease resistance, length of life cycle, culture maintenance expense, and yield of consumable insect material dictate to a large degree those species which are chosen for this purpose. Aside from rearing problems, the size and general appearance of the

insects might be important factors controlling their acceptance by some insectivorous birds. Methods of rearing several other insect species will be the subject of a later paper (Ficken and Dilger, in Press).

Hocking and Matsumura (1960) have recognized the potential value of bee larvae for human consumption. According to Hans Löhrl (personal communication), bee larvae as well as wasp larvae were used successfully as bird food supplements. However, extensive utilization of bee larvae has been handicapped because efficient techniques for harvesting the larvae have not been developed.

Consequently a co-operative project was initiated by the Laboratory of Ornithology and the Department of Entomology to investigate the production of bee larvae in quantity, to improve the techniques of rearing and harvesting, and to make preliminary observations on the acceptance of these larvae by a few birds.

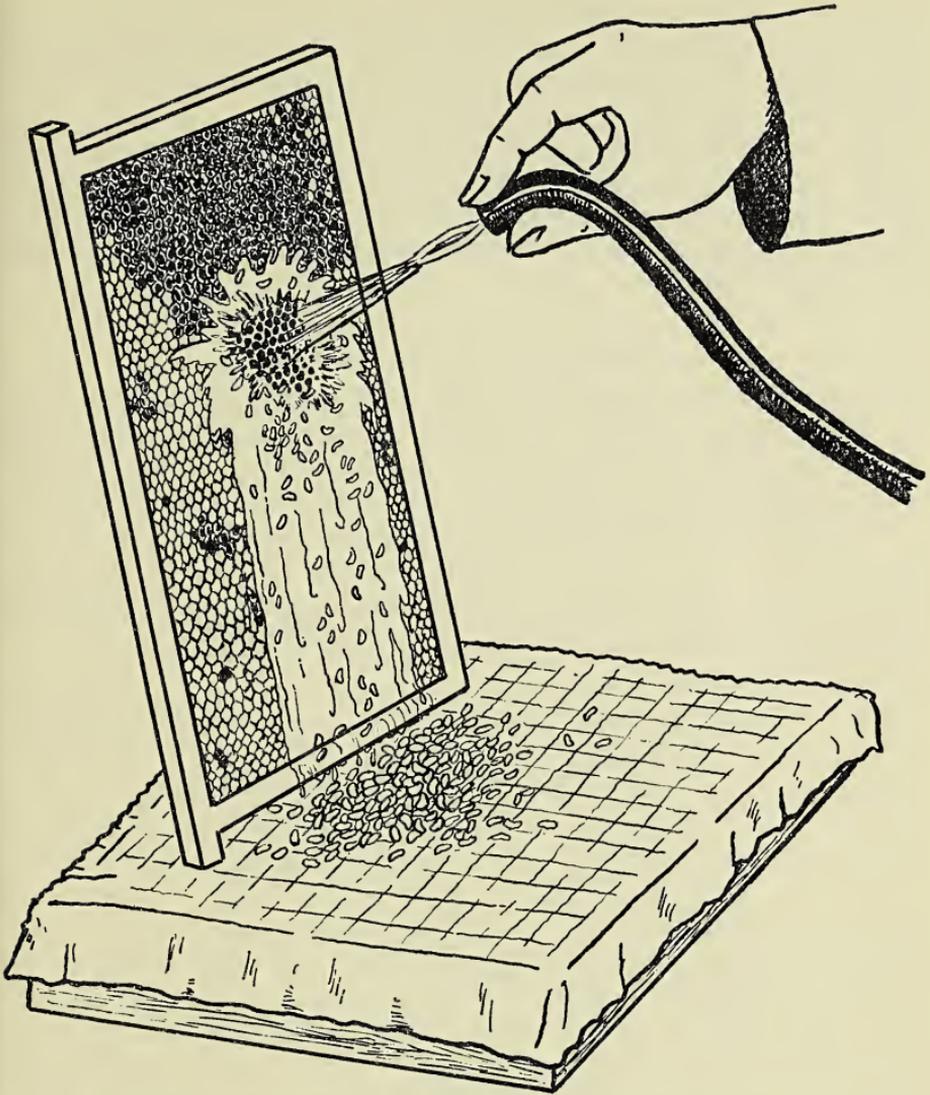
EXPERIMENTAL PROCEDURE

Small honey bee colonies were used for the production of larvae, since the problems of manipulation were reduced to a minimum with very little sacrifice in brood production. The size of the colonies arbitrarily was limited to five standard Langstroth frames of dark brood comb. Six colonies were established by installing 5 pounds of bees with an Italian queen into each colony. After the queens began to lay eggs, manipulations were started to concentrate brood rearing in single combs in order to facilitate harvesting. Queens were located and confined on individual frames of comb by means of a five-mesh wire hardware cloth cage (any type of queen excluder material would be equally satisfactory). Thereafter the queens were kept in their respective cages for the duration of the experiment. Every fourth day a frame of empty, dark brood comb which was suitable for egg-laying was placed into the cage, thus providing the queens three days in which to fill each comb with eggs. Combs of eggs were placed outside the cage within the colony where they were maintained by the worker bees until the larvae were sufficiently mature to harvest.

HARVEST TECHNIQUE

Before larvae can be harvested by any technique it is necessary to remove the caps of sealed cells. This can be done by carefully shaving away the cell caps with a thin, finely serrated knife. The uncapping process seems easier if the brood comb is chilled momentarily in cold water just prior to uncapping.

In the past the conventional harvest technique has been the removal of individual larvae from honeycomb cells using small forceps. Hocking and Matsumura (1960) recently suggested an improved technique known as the swing and impact method. The frame of brood comb



Bee larvae being washed from frame of honeycomb by a jet of water.

is swung downward so that one end of the frame edge collides with a block. The impact dislodges larvae which fall on to a collecting tray. Both of these techniques were briefly tested in this laboratory. It was found that older larvae which contributed most to the yield were very difficult to remove from the cells.

A water removal technique was developed which proved very efficient in removing all of the larvae from the cells. Larvae normally lie in the bottoms of their cells, adhering to sticky beds of milky brood food. By standing a comb on one end and spraying a stream of water over the comb surface, the bed of food is diluted or washed away while

the water pressure simultaneously forces the larvae from their cells (see Figure). They fall a short distance on to a cheesecloth supported by a wire grid. Here they are washed free of food and may be fed immediately to the birds or preserved by freezing.

After the combs are washed free of larvae and nectar, and the water is shaken from the cells, the combs are ready to be placed into the colony for further brood production. Such dark brood combs free of all brood and honey are very attractive to queens, encouraging maximum oviposition.

TIMING THE LARVAL HARVEST

Larvae may be harvested approximately nine to eleven days after the queen begins laying in the comb. They are extracted most conveniently just prior to the capping of the cells. However, larval weight increases very rapidly at the time the cells are sealed and shortly thereafter. Thus, it is more efficient in terms of the mass of harvested food to delay larval removal until the youngest larvae are just being capped. The Table indicates the differences obtained by harvesting ten days after queen confinement rather than nine days.

TABLE.—Production of Worker Honey Bee Larvae (grams per comb, wet weight).

Time of Harvest after Queen Confinement			
		9 days	10 days
Maximum weight	. . .	288	314
Minimum weight	. . .	38	167
Mean weight	. . .	145	233
Number of combs harvested		21	10

BIRD FOOD POTENTIAL

It is possible for each colony to produce approximately one pound of larvae every six days. Production is usually possible from late spring to early fall in temperate climates. This period corresponds to the most active nesting season of birds and consequently would be a convenient source of living insect material for immature birds.

The nutritive value of bee larvae is indicated from preliminary analyses by Hocking and Matsumura (1960). The average percentages (wet weights) for fat and protein were found to be 3.71 and 15.4 per cent respectively for mature larvae. Notably high values were found for vitamins A and D. Vitamin D was found in concentrations of 6,130 to 7,430 I.U./G. wet weight, compared to 100 to 600 I.U. in cod liver oil.

FEEDING OBSERVATIONS

Observations have been made at the Cornell University Laboratory of Ornithology concerning the feeding of birds with bee larvae. Paul Mundinger (personal communication) found that young American Goldfinches, *Spinus tristis*, taken from the nest at about the time of fledging (twelve to fifteen days) took bee larvae from forceps almost exclusively the first day, while refusing to eat voluntarily a mash mixture when it was presented to them. On the following days mash was eaten voluntarily but bee larvae still seemed to be preferred. As the birds grew older the amount of bee larvae was reduced until at three weeks of age they each received approximately six larvae per day. At this time they were husking and eating seeds, which then formed most of their diet, although some still seemed to prefer the larvae.

One of the authors (Stein) has successfully used bee larvae as the base of a mix for hand-raising Traill's Flycatchers *Empidonax traillii*.

DISCUSSION

The adult bee population dwindles rapidly in the summer, owing to a short life span of approximately six weeks. During long-term production of larvae, steps must be taken to ensure an adequate population in the colonies since larval nutrition and oviposition activity are dependent on population. An adequate colony population can be maintained by allowing some brood to complete development by the addition of emerging brood or by the addition of adult bees in queenless packages which are usually available commercially by the pound.

Bee larvae seem ideal for bird food. They are succulent, do not have spiny or bulky cuticular material, and are not known to contain offensive protective secretions. Larval food is composed entirely of pollen, honey, and nutritious secretions similar to royal jelly. The life cycle variations are very small, enabling precise control over timing larval harvest. During periods when larvae are not needed the colonies are largely self-sufficient. Beekeeping equipment is generally economical and is placed in the field, thereby freeing laboratory space. Manipulations are quite simple and can be learned in a short time. Several excellent references are available on bee culture (Eckert and Shaw, 1960; Grout, 1949; Root, 1954). The chief disadvantage in rearing bee larvae is the fear of stings but this objection is a minor one if routine precautions are observed.

The ultimate value of honey bee larvae for bird food can be determined only by extensive feeding tests with many bird species. These larvae may have similar utility as a food for certain reptiles, fish, and small mammals which are held in captivity for behavioral studies.

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LONDON ZOO NOTES

By J. J. YEALLAND

A specimen of the Indian Blue Robin or Blue Chat (*Luscinia brunnea*), presented by Messrs. G. H. and J. R. Newmark, is the first of this species to be in the collection. As can be seen from the good coloured illustration in Salim Ali's *Indian Hill Birds*, the name is not appropriate, for the male is slate coloured above and pale rufous beneath with a white stripe above the eye and on either side of the throat. The female is brown, paler beneath. The tail is moved in a characteristic Redstart manner.

There are two races, the one referred to being the nominate race which breeds in the Himalayas between about 5,500 and 11,000 feet and winters in the foothills and as far southward as Ceylon, and *L. b. wickhami* which is resident about Mount Victoria in the Chin Hills and in which the male is a little paler and smaller and the female dull slaty-blue above instead of brown.

Other arrivals of especial interest are two White Storks, a young pair of Green Peafowl bred in Fifeshire by Mr. Tom Spence and presented by him, together with an Orange-breasted Green Pigeon and a Uganda Green Pigeon ; a Kenya Eagle-Owl and a Yellow-plumed Honey-eater (*Meliphaga ornata*), the first to be received since more than fifty years ago.

Dr. J. G. Harrison, Merriewood, St. Botolph's Road, Sevenoaks, Kent, would be grateful for the heads of pheasants in order to study the skull pneumatisation.

* * *

BRITISH AVICULTURISTS' CLUB

The seventy-second meeting of the Club was held at the Rotary House Club, 21 Portman Square, London, W. 1, on Wednesday, 11th January, 1961, following a dinner at 7 p.m.

Chairman : Mr. K. A. Norris.

Members of the Club : Miss P. Barclay-Smith, P. S. Bates, A. W. Bolton, Miss K. Bonner, W. Brain, W. D. Cummings, B. Dittrich, M. D. England, Miss R. Ezra, Colonel H. B. Finch, Mrs. O. L. Gent, Mrs. R. Goodman, Dr. R. Gottlieb, H. J. Harman, L. W. Hill, Miss R. Hill, Dr. W. C. Osman Hill, Dr. E. Hindle, F. E. B. Johnson, Miss E. M. Knobel, A. J. Lambert, Captain J. Lee-Hudson, P. H. Maxwell, W. R. Partridge, A. A. Prestwich, B. E. Robinson, E. O. Squire, Newton R. Steel, E. N. T. Vane, Mrs. H. M. Vane, P. L. Wayre.

Members of the Club, 32 ; guests, 15 ; total, 47.

The Club is very fortunate in having Kenneth Norris as its new Chairman. The happy manner in which he introduced the speaker for the evening showed that he is destined to act in this capacity with considerable distinction.

E. N. T. Vane gave a commentary on a series of Kodachromes projected by A. W. Bolton. The slides were selections from their two very extensive collections and illustrated "Meanderings of an aviculturist with a camera". The majority of Vane's slides were of birds that are, or have been, in his own collection, such as lutino and blue Ring-necked Parrakeets, lutino Nyasa Lovebirds, Black-headed Caiques, young Splendids being hand-fed, a Yellow-cheeked Amazon that had been hatched and reared by a Grey Parrot, a pet Tawny Owl, etc. Vane has a collection of some 800 slides of coloured plates of the Psittacines and several of these were projected to demonstrate the differences in the various forms of island King Parrakeets ; a group he is at present studying.

We were also shown numerous photographs taken at the Wildfowl Trust, the London Zoo, various bird shows, Miss Knobel's unique lutino Black-headed Caique, Bolton's own pair of Baillon's Toucanettes, and many others. Altogether a very enjoyable and instructive programme.

The next meeting of the Club is on **WEDNESDAY, 8th March, 1961.**

ARTHUR A. PRESTWICH,
Hon. Secretary.

* * *

NEWS AND VIEWS

Paul Schneider has been elected President of the Avicultural Society of America, with David West as Vice-President.

* * *

Jack Kiracofe has been selected by the American Pheasant Society as the Society's Master Waterfowl Breeder, 1960.

* * *

After ten years Donald Risdon has retired from his position as General Manager of the Dudley Zoological Gardens. He has been succeeded by Cyril F. Grace.

* * *

The Simon Harvey Memorial Medal of the Avicultural Society of South Australia, for the outstanding breeding achievement of the year, has been awarded to W. Curl, for breeding the Blue-eyed Squatter or Partridge Bronze-winged Pigeon.

* * *

Claude Payne reports : " I have bred the following during the last season : 4 Crimson-wings, 6 Blue-winged Grass Parrakeets, 3 Turquoisines, 4 Bourke's, 3 Derbyan, 4 Barrabands, 2 Rock Peblers, 1 Pennant, and 5 Golden-mantled Rosellas.

Many other pairs went to nest, and I was particularly happy about my Wandering Tree Pies which had two young to nine days old. Alas, another Medal slipped away ! "

* * *

Sir Crawford McCullagh's parrakeet breeding results at Lismara last year were : 22 Splendids, 3 Blue-winged, 4 Stanleys, 5 Many-coloured, 15 Red-rumped (7 yellow), 7 Ring-necked (4 blue/lutino and 3 blue/green), 9 Yellow-rumped, 4 Red Rosellas, 1 Barraband, 1 Bauer's, 4 Rock Peblers, 4 Plum-headed, 4 Pennants, 8 Layards, and 10 Nyasa Lovebirds. The waterfowl—4 Cinnamon, 3 Common, and 1 Cape Teal, 9 American Wigeon, 10 Carolina, and 4 Common and 2 Red-crested Pochard. Finally, 4 Common Pheasants.

* * *

G. A. Gjessing, Drammen, Norway, sends his results for 1960. He writes : " The season was not very good, too much rain, but I was able to breed 3 Barrabands, 6 Golden-mantled Rosellas from imported Australian parents, 4 Pale-headed Rosellas, 2 Pennants, and 12 Cockatiels, 12 Painted Quail, and about 150 Budgerigars, of which 26 were good violets. Bourke's and Turquoisines had good eggs in the nest but one evening a cat got on the roof of the Grass Parrakeets' aviary. The hens were scared off their nests and although they again

entered their nest-boxes in the morning it was then too late—the eggs were cold and spoiled. In addition, two male Bourke's killed themselves. After this disaster there were no further breeding attempts."

* * *

The *Magazine* is usually very free from typographical errors, consequently when any such appears it is the more noticeable. This is especially the case when it concerns a personal name. Discerning members will assuredly have realized that "J. S. Riggsa" (page 250 of the last number) cloaked the identity of our Cumberland member J. S. Rigge.

* * *

In "News and Views" in the last number of the *Magazine* mention was made of two pairs of cockatoos nesting with Major V. Dilwyn Jones. The Major now writes: "The young Citron-crested died whilst I was away on the Continent—I think it was the cold, wet weather. The second attempt of the Salmon-crested was also a failure—both eggs infertile."

* * *

In *The Scotsman*, 3rd December, 1960, T. H. Gillespie, for so many years Director of the Zoological Park, Edinburgh, reports the death of a Griffon Vulture after being in the Zoo for over forty-six years. It was, in fact, the Zoo's oldest inhabitant. As it was fully adult when it arrived its age could not have been much less than fifty years. This is likely to be a record age for a vulture of this species.

* * *

P. S. Henry reports: "This year I have successfully reared two Ring-necked Parrakeet hybrids. The parent birds are a male African and a female Indian." This is quite possibly the first time this sub-specific cross has been fully reared. In 1911 Canon Dutton had three hatched which were doing well and apparently likely to be reared at the time of the report, but nothing further was recorded about them.

* * *

Paul Schneider is, of course, primarily a breeder of Psittacines, but he is also interested in pheasants. Last year his Satyr Tragopans produced five young ones, two males and three females. The female laid a total of seventeen eggs over a period of ninety days. Two eggs were broken by being laid from the perch and one was broken by an unsteady sitting hen. One chick was hatched on 9th May, two on 5th June, one on 15th June, and one on 8th July. All fourteen eggs were fertile; six embryos died on the twenty-fourth or twenty-fifth day of incubation.

Lloyd B. Thompson, British Columbia, writes: "My Prince Lucien's Conures reared six young this year. The hen laid six eggs, all fertile, and hatched and reared them all with less trouble than most. They are fantastically tame and we have really enjoyed them. American breeders say they have never been bred on this Continent." The Prince Lucien has been described as "common in captivity and easily reared". But actually *Pyrrhura picta lucianii* is very rare, and such records as exist almost undoubtedly refer to the Red-bellied *P. frontalis frontalis*. The breeder has sent an excellent photograph of the six young ones and there is no mistake about correct identification. This success is in all probability a world "first".

* * *

In the July-August, 1960, number of the *Magazine*, on page 143, Squadron-Leader Charles Everitt writes of the Kenya race of the Beautiful Sunbird: "Unlike the Senegal sub-species, there is no non-breeding dress."

The Squadron-Leader now tells me that this statement was based on the authority of Mackworth-Praed and Grant and is not, in fact, correct. At the time of writing there had not been a specimen in the Edward Marshall Boehm collection sufficiently long to disprove this. But "now we can as our specimen here has gone out of colour but has retained the elongated tail-feathers and the metallic-green wing butts".

* * *

Tom Spence writes: "During the summer I received a most remarkable pair of Bar-shouldered Doves, which laid within ten days of importation and have never been without eggs or young in the nest since. They reared three fine broods but unfortunately three young were killed and the male badly injured while brooding the fourth set of eggs, by a weasel that had squeezed into the aviary.

I had quite a tragedy last week (end of October) when five out of seven of a group of wing-clipped, eighteen-month-old Green Peafowl were killed by probably an escaped mink or ferret. They were in an open enclosure of about an acre and roosted on a great pile of boughs which I suppose would give such a predator an ideal opportunity. One Vulturine Guinea-fowl was killed in the same manner in a neighbouring enclosure. The five other Green Peafowl of the same age were at full-winged liberty and, of course, were safe as were the older birds in their aviaries.

A newcomer is of some interest—a Green-backed Trumpeter; the first I have seen of its kind. It was sent to me as a Grey-backed and the dealer even went so far as to certify it as *Psophia crepitans*. It is a very fine bird in very good condition. The colour reminds me

somewhat of a Roulroul and a hen Congo Peacock with metallic-green wing-coverts and a metallic-purple lower and anterior neck. It is as tame as the other two species I have kept but less demonstrative and less vocal. It and my Woolly Monkey are great pals already."

* * *

Paul Hansen, Odense, Denmark, reports: "I have had quite a good breeding season. Crimson-winged, six reared; first nest four eggs, four hatched, one young one died after about two days but the other three grew up into very nice birds after being hand-reared. Each year the hen starts to neglect her first young about eight to eleven days after hatching, so this year I brought them in at the first sign. A fortnight later she went to nest a second time and again laid four eggs; three hatched, the fourth containing a well-developed chick. This brood the hen, as usual, reared unaided. She has behaved in this manner every year she has been breeding with me. Why does she do it?"

One pair of Princess of Wales reared a nest of seven young. The hen had five eggs of her own, to these I added the eggs of a second hen which got badly egg-bound with her third egg. A short time after the youngsters left the nest the hen nested again; three eggs, all hatched, but only one young one lived to leave the nest.

One pair of Splendids had two young: one, a female, is a very peculiarly coloured bird, a kind of pastel shade, nothing like the colour of a normal Splendid. Fortunately the other, a male, grew up and is becoming a very nice bird. The old male died so I propose mating the two next season, just to see what, if anything, turns up. Another pair of Splendids reared only one. Three young reared by four pairs may be considered a very meagre result. Elegants did nothing, and Leadbeaters, Amazons, and two other pairs of Princess of Wales followed their bad example."

A. A. P.

* * *

REVIEWS

BUCEROTIDAE. By K. SANFT. W. de Gruyter and Co., Berlin, 1960. Price DM. 78.

This monographic revision of the entire family of the hornbills constitutes the latest section (*Lieferung* 76) of the well known series of treatises in the German language (under the general title "Das Tierreich") upon specific groups of recent animals; it maintains the high standard of its predecessors, many of which, more especially among the earlier issues, have been devoted to avian families.

All surviving hornbills are treated as a single family, Bucerotidae,

represented by fourteen genera. The usual division into two sub-families is not recognized, the Ground Hornbills (*Bucorvus*) not being separated from the remainder.

An introductory chapter deals with general topics, with a short section on anatomy, a distributional map, a section on ethology, and a very useful catalogue of parasites known from hornbills. This chapter ends with a commentary on the systematic position and probable evolution of the family and a short reference to the single known fossil form, the Eocene *Geiselornis*. Then follows a key for the easy identification of the fourteen genera.

The largest genus *Tockus*, with fourteen species, is then treated systematically, each species being briefly described and its distribution, biotope, migration, food preferences, and reproductive behaviour recorded so far as it is known. The same procedure is followed with all the other genera and species, and in many cases there are additional comments in an appendix.

Illustrations are clearly drawn sketches depicting the specific, sub-specific and, where applicable, sexual differences rendering identification easy without resort to colour. There are also excellent maps showing the distribution of each form.

A bibliography of fourteen pages concludes the volume. The volume is to be highly commended as a work of reference though clearly intended more for the scientific specialist than the aviculturist.

W. C. O. H.

* * *

FUGITIVE REACTIONS IN AVIAN BEHAVIOUR. By MARTIN MARKGREN. *Acta Vertebratica*, Vol. 2, No. 1. Zoological Department, Nordiska Museet and Skansen, Stockholm, 1960.

The author describes and discusses the behaviour shown by birds to escape or avoid things, both animate and inanimate, that are or might be harmful or frightening to them. He has read widely and carefully on the subject and also made long and careful personal observations of birds in the field in Sweden and elsewhere.

Those who accuse bird behaviour students of preferring the use of esoteric jargon to plain English may find here some ammunition for their guns. Others may not agree with all the definitions that the author proposes or accepts. The reviewer, for example, considers it misleading to use the term "mobbing" only if the "mobbing" has *not* been provoked by hostile action. This would entail calling the demonstration of a pair of Chaffinches against a Jay that had alighted by chance near their nest as "mobbing", yet using some other term for exactly similar behaviour by another pair of Chaffinches towards a Jay which was actually searching for their nest.

However, such minor criticisms must not put anyone off reading this

work which, especially where the author is dealing with his own observations and experiments, provides a great deal of information clearly presented and cogently discussed.

Among other things we learn that *all* short-necked birds do *not* signify "hawk" and elicit escape reactions in smaller species; that the Pine Grosbeak, like some other northern birds, has no fear of man although it reacts just as strongly as most species to some predatory mammals and to birds-of-prey. That birds that are not frightened of a walking or standing man will often flee if he makes a throwing movement towards them is well known but, unlike others, the author has made repeated and painstaking experiments on this and other aspects of birds' fear of man. He shows that, at least in the wild populations of gulls and crows which he studied, it is the speed and acceleration, not the throwing movement in itself, that causes fear. Also certain arm movements that cause gulls to take wing do so because of their resemblance to the slow wing beats of a flying eagle.

All who are interested in bird behaviour should read this book and aviculturists will probably find much in it that can also be of practical use in connection with keeping or taming birds.

D. G.

* * *

CORRESPONDENCE

TAWNY OWLS TAKING PARTRIDGES?

I would be very grateful for advice on how to solve a problem concerning what I believe to be Tawny Owls, a pair of which has lived and nested near my garden for some years.

A wire-netting fence of 1 in. mesh, buried 1 ft., stands 7 ft. high round three sides of my garden enclosing, with the house end—a high brick wall—as the fourth side, about three-quarters of an acre of lawn, shrubbery, and a small pool. There are no signs of rats against which traps and Warfarin bait are continuously set.

In this enclosure are a collection of waterfowl, ranging in size from Teal to Ruddy Sheldduck, Chinese and Golden Pheasants and—*and here comes my problem*—Partridges. All the birds are tame and, of course, pinioned.

Everything lives in peace and security except the Partridges, of which I introduced the first pair last year. Within a few weeks I found first the one and then the other killed. One corpse was near the surrounding wire in open, short grass and the other in the middle of a lawn. Each was decapitated, the head a few inches from the corpse and a little bunch of feathers, presumably caused by the "kill", a foot or so away. In each case the flesh had been neatly torn from the breast starting from the neck.

Last June I introduced two more pairs. Very soon I found a similar corpse, shortly after that one was found drowned, and it was not long before the remaining two followed the first one. The same fate has overtaken two more put into the garden in October and one pheasant poul in July.

I have some more equally tame Partridges in covered runs but do not want to submit them to the same hazard.

Are there any means of combating this menace?

J. E. HARRIS.

WOOD LAWN,
UTTOXETER,
STAFFORDSHIRE.

SOME ADVERSE COMMENTS ON THE NATIONAL SHOW

We shall, I doubt not, see eulogies of the Olympia show in print. Indeed, I saw much deserving of praise on my two visits to the show. The fine condition of most of the exhibits and the obvious care that had been taken to make most of the "British Softbills" comfortable in their roomy show cages, for examples.

Nevertheless, there was much that could *and did* bring Aviculture into disrepute.

First, the dealers' stands. One of these was really the worst of its kind that I have ever seen; not excluding the bird shops of Beirut and Cairo, and Sclater Street on a Sunday morning. Blossom-headed Parrakeets packed almost like sardines; Glossy Starlings equally overcrowded, their drooping wings plastered with excrement; sick and dying tanagers (one escaped but was easily recaptured as it scuttered over the floor too weak to fly); these were but three of many cages most of which held equally miserable captives. The other dealers' stands were very much better but each had some birds that should never have been publicly displayed. At one a Black-capped Waxbill, recognizable as such only by its bill coloration, was bare except for wing and tail quills and many of its comrades (it was in a cage with very many other waxbills and finches) were only a little less pitiable in condition. At another a huddled crowd of very sick and sorry-looking zosterops and two extremely bedraggled sunbirds were, when I saw them, attracting adverse comment from three well-known ornithologists.

Innocent aviculturists and dealers will probably suffer as a result of this. Many members of the Royal Society for the Protection of Birds and the R.S.P.C.A. visited the show and I should be surprised if some of them do not try to get the import and keeping of foreign birds prohibited as a result of what they saw.

To those who know nothing of bird-keeping the British finches and buntings in their minute cages give a very bad impression. It is no use the apologists of bird shows saying glibly "but everyone knows the birds are not kept in those little show cages". Everyone does *not* know this and the "British Hardbills" section of this show makes many fervent enemies for the keeper of British species.

Personally I am somewhat hardened to the cruelties of the bird trade and realize, anyway, that its worst excesses have never caused such suffering as is entailed in the production of our Sunday joints and breakfast bacon. I was most horrified I think when I looked closely at the ugly mass of feathers that was a winning Norwich Canary. The bird peered at me with tiny sunken eyes from beneath its unnaturally beetling brows. It reminded me of a very fat Middle White pig and was equally devoid of any trace of beauty. In a way the cruelty and callousness of Man seems almost less culpable than his deliberate and devoted production of such hideous travesties of birds.

DEREK GOODWIN.

40 FRANKFURT ROAD,
LONDON, S.E. 24.

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The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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- 1953 BUNTON, Dr. P. H. ; "Elim," P.O. Addo, E. Cape Province, South Africa.
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- 1952 FIORAVANTI, The Marquis ; Bellosguardo 14, Florence, Italy.
- 1959 FITZSIMMONS, EDWARD R. ; 330 West 20th Avenue, San Mateo, Calif., U.S.A.
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- 1959 FORD, EDWARD J. ; 215 Ash Avenue, Chula Vista, Calif., U.S.A.
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- 1959 FORMAN, ALBERT J. ; Woodbrook Drive, Springdale, Stamford, Conn., U.S.A.
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- 1933 FRAYNE, RALPH ; 50 Cantley Lane, Bessacarr, Doncaster.
- 1958 *FRELINGHUYSEN, GRISWOLD ; Woodstock, Vermont, U.S.A.
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- 1950 GADD, J. A. ; 75 Holly Road, Aldershot, Hants.
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- 1951 GARNER, R. S. J. ; Birdhaven, Rocombe Lane, Raymonds Hill, Axminster, Devon.
- 1951 GARRATT, J. C. ; "Crossways," Sea Avenue, Rustington, Sussex.
- 1949 GARY, FRANK L. ; Earlham, Georgetown and Wrightstown Road, Columbus, New Jersey, U.S.A.
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- 1956 HENRY, The Rev. B. C. R. ; Sunapanga, Balliguda, Dt. Phulbani, Orissa State, India.
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- 1960 KILPIN, COLIN J. ; 111 Kings Road, Five Dock, Sydney, N.S.W., Australia.
- 1938 KING, H. T. ; Flat B, 36 Magdala Road, Mapperley Park, Nottingham.
- 1956 KINGSTON, J. ; "Berwyn," Bilston Road, Willenhall, Staffs.
- 1936 *KINSEY, ERIC C. ; 17 Southwood Avenue, Ross, Calif., U.S.A.
- 1959 KIRACOFE, JACK M. ; Lakeview Waterfowl, Boiling Springs, Penna., U.S.A.
- 1950 KIRK, KEITH C. ; 52 Station Road, Sutton-in-Ashfield, Notts.
- 1953 KIRK, R. S., M.B., F.Z.S. ; 3 Park Crescent, London, W. 1.
- 1960 KIRK, STEWART ; Wellingore Hall, Wellingore, Lincoln.
- 1948 KIRKALDY, MRS. M., F.Z.S. ; The Grove, Warley Mount, Brentwood, Essex.
- 1952 KIRKHAM, R. G. ; "The Gables," Wynnsward Park, Clonskeagh, Co. Dublin, Eire.
- 1957 KJELLAND, ERLING G. ; 1728 N. Sedgwick Street, Chicago 14, Ill., U.S.A.
- 1960 KLÖs, DR. HEINZ-GEORG ; Zoologischen Gartens zu Berlin, Hardenbergplatz 8, Berlin W. 30, Germany.
- 1954 KLÖVEKORN, WERNER ; Pfalzdorferstrasse 61, (22A) Goch/Rhld, Western Germany.
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- 1955 KREUGER, R. ; Stockholmsgatan 17, Helsingfors, Finland.
- 1959 KUPERBURG, JOEL ; Caribbean Gardens, Naples, Florida, U.S.A.
- 1954 KYME, R. T. ; 30 King Street, Kirton, Nr. Boston, Lincs.
- 1947 LABDON, B. ; Millberne, Cullompton, Devon.
- 1958 *LACEY, GEORGE M. ; Route 4, Box 420, Fort Myers, Florida, U.S.A.

- 1959 LAGOS, TITO ; Av. Sidonio Pais, 22, 1°, Lisbon, Portugal.
- 1929 LAIDLAY, J. C., F.R.Z.S.(Scot.) ; Holmwood, Isla Road, Perth, Scotland.
- 1951 LAKE, F. B., M.R.C.S., L.R.C.P., F.Z.S. ; 95 Richmond Road, Kingston-on-Thames, Surrey.
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- 1945 *LAMB, A., F.Z.S. ; Mount Pleasant, Hexham, Northumberland.
- 1957 LAMBERT, A. J. ; 1 Beechcroft Close, Sunninghill, Ascot, Berks.
- 1957 LAMM, HAROLD G. ; Curator of Birds, Cleveland Zoological Society, Cleveland 9, Ohio, U.S.A.
- 1954 LANCASTER, M. C., Ph.D., B.Sc., M.R.C.V.S., F.Z.S. ; Pheasant Walk, Cobb Hall, Sharnbrook, Beds.
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- 1954 LANG, Dr. E. M. ; Zoologischer Garten, Basel, Switzerland.
- 1950 LANGBERG, WALTHER ; Tudskaervej 22, Copenhagen, Vanløse, Denmark.
- 1958 LANGRIDGE, E. A. ; "Rustic Way," Church Lane, Northaw, Potters Bar, Middx.
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- 1952 LAWRENCE, C. C. ; Normacot, Cressing, Braintree, Essex.
- 1955 LAWRENCE, K. J., F.Z.S. ; 3 The Milestones, Hatfield Peverel, Essex.
- 1930 LAX, J. M. S. ; Southfield, Crook, Co. Durham.
- 1949 LAZZERONI, IVO ; 524 South Dancove Drive, West Covina, Calif., U.S.A.
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- 1959 LE BLOND, JAMES E. ; 43 Half Moon Lane, Herne Hill, London, S.E. 24.
- 1958 LEE, C. R. ; 21 Church Lane, Bainton, Stamford, Lincs.
- 1953 LEE, N. A. ; 8 Canada Crescent, Bispham, Blackpool.
- 1959 LEMBURG, WILLIAM W. ; Cairo, Nebraska, U.S.A.
- 1946 *LEMON, Miss E. K. ; c/o 1007 Government Street, Victoria, B.C., Canada.
- 1947 LESLIE, JOHN ; 34 Amroth Avenue, Toronto 13, Ontario, Canada.
- 1949 LEVER, H. ; "Politelis," 5 Shelley Grove, Hyde, Cheshire.
- 1957 LEVON, Dr. H. ; Box 497, Welkom, O.F.S., South Africa.
- 1957 LEWIS, Mrs. KARL E. ; P.O. Box 148, Houma, Louisiana, U.S.A.
- 1958 LEWIS, LESLIE G. ; Sheriff's Office, Court House, Bathurst, N.S.W., Australia.
- 1946 LEWIS, W. O. ; "Milnsbridge," Bicton, Nr. Shrewsbury.
- 1955 LIEVENS, D. ; Kaaiweg 46, Moerzeke, by Dendermonde, Belgium.
- 1952 LIMBERG, HANS ; Aurelius-Str. 31, Aachen, W. Germany.
- 1960 LINCOLN, DONALD A. ; "Rodney," 9 Wallace Crescent, Chelmsford, Essex.
- 1951 LINDSAY, ALEXANDER ; P.O. Box 624, Sequim, Washington, U.S.A.
- 1956 LINDSAY, P. A. ; "Glendene," Surig Road, Canvey Island, Essex.
- 1959 LIU, HERBERT F. Y. ; 1840 Lusitana Street, Honolulu 13, Hawaii.
- 1941 LIVERMORE, JOHN W. ; The Old Stone House Farm, P.O. Box 77, West Redding, Conn., U.S.A.
- 1960 LOHRER, FRED ; 55 Grove Street, Ridgefield Park, New Jersey, U.S.A.
- 1960 LOLY, VICTOR G. ; Box 270, Anaheim, Calif., U.S.A.
- 1956 LONGHURST, Mrs. A. R. ; c/o Bird Room, British Museum (Natural History), Cromwell Road, London, S.W. 7.
- 1954 LONSDALE, Mrs. E. M. ; Grove House, Stapleford Abbots, Romford, Essex.
- 1958 LORRISON, W. R. ; 46 King's Road, New Haw, Weybridge, Surrey.
- 1951 LOUWMAN, P. W., M.B.O.U. ; Dierenpark Wassenaar, Rijksstraatweg 667, Wassenaar, Holland.

- 1960 LOVELESS, STANLEY B. ; "Minley," 22 The Glade, Stoneleigh, Epsom, Surrey.
- 1959 LOW, Miss ROSEMARY ; 8 Old Farm Road West, Sidcup, Kent.
- 1927 LOWE, The Rev. J. R., M.A. ; The Vicarage, Coln St. Aldwyns, Cirencester, Glos.
- 1960 LOWREY, B. ; 101 George Street, Inverell, N.S.W., Australia.
- 1959 LOWRIE, THOMAS ; R.R.5, Tillsonburg, Ontario, Canada.
- 1955 LUKE, J. A. ; Bona Lodge, Aldourie, Inverness.
- 1947 LUMSDEN, Lt.-Col. WILLIAM V. ; Sluie, Banchory, Aberdeenshire, Scotland.
- 1956 LUPTON, H. ; 21 Deneside Mount, Bankfoot, Bradford 5, Yorks.
- 1952 LUTHER, H. M. ; 26 Park Crescent, Portland Place, Regent's Park, London W. 1.
- 1947 LYNCH, G., F.Z.S. ; "Newlyn," Point Clear Road, St. Osyth, Essex.
- 1960 LYNN, M. W. ; 54 Maycross Avenue, Morden, Surrey.
- 1957 LYONS, Mrs. JUNE R. ; P.O. Box 1947, Durban, South Africa.
- 1959 MACHADO, A. R. ; No. 50—9th Street, Linden, Johannesburg, South Africa.
- 1960 MACKELL, F. A. ; 23 Sutherland Crescent, Darling Point, N.S.W., Australia.
- 1959 MACKINNON, J. R. ; 2 Abbot Street, Arbroath, Angus, Scotland.
- 1953 MACRAE, Miss H. I. ; 15 Forbes Road, Edinburgh 10, Scotland.
- 1957 MACROW, PETER M. ; 8 Meredyth Avenue, Millswood Estate, South Australia.
- 1958 MADIGAN, Mrs. CYNTHIA B. ; Branwen, Sands Point Road, Sands Point, Long Island, New York, U.S.A.
- 1959 MADSEN, HENNING ; "Rubi," Nørremøllevej, Viborg, Denmark.
- 1956 MAKIN, C. ; "Slievenamon," 65 New Street, Sutton, St. Helens, Lancs.
- 1958 MALE, W. ; 16 High Street, Potters Bar, Middx.
- 1958 MALKINSON, N. S. ; Wargundy Orchards (Pty.) Ltd., P.O. Box 18, Westminster, O.F.S., South Africa.
- 1960 MALLINSON, J. J. C. ; "Clos Tranquil," St. Aubin, Jersey, Channel Islands.
- 1960 MAMLOK, R. L. ; P.O. Box 951, San Mateo, Calif., U.S.A.
- 1960 MANTON, Lady ; Plumpton Place, Nr. Lewes, Sussex.
- 1959 MARCIACQ, Mrs. MARITA ; P.O. Box 41, Panama, Republic of Panama.
- 1957 MARSH, E. G. ; Little Well, The Avenue, Sneyd Park, Bristol 9.
- 1960 MARSHALL, ROY L. ; M. and M. Bird Ranch, 2143 S. Myrtle Avenue, Monrovia, Calif., U.S.A.
- 1930 MARTIN, A. ; 26 Somerford Road, North Reddish, Stockport, Cheshire.
- 1951 MASON, H., M.C., F.Z.S. ; 2 Dunstan Road, London, N.W. 11.
- 1960 MASON-WENN, J. E. ; Badgworth, Nr. Axbridge, Somerset.
- 1956 MATTHEWS, F. A. ; 66 Tindale Road, Artarmon, N.S.W., Australia.
- 1959 MATTLIN, ROBERT H. ; Director, Crandon Park Zoo, Kay Biscayne, Miami, Florida, U.S.A.
- 1956 MAXWELL, E. A. ; "Wards Farm," Gartocharn, Dumbartonshire.
- 1929 MAXWELL, P. H., F.Z.S., M.B.O.U. ; c/o Zoological Society of London, Whipsnade Park, Nr. Dunstable, Beds.
- 1913 *MAXWELL-JACKSON, Miss M., F.Z.S. ; Percy House, Scotton, Knaresborough, Yorks.
- 1922 *MAYER, F. W. SHAW, C.M.Z.S. ; c/o Mr. R. W. Tebb, Lae, New Guinea, via Australia.
- 1960 MEADEN, FRANK ; The Aviaries, 84 King Edward Street, Slough, Bucks.

- 1960 MEAKIN, A. R. ; 56 Fewster Road, Hampton, Victoria, Australia.
- 1955 MEES, G. F. ; Western Australian Museum, Perth, Western Australia.
- 1958 MELVIN, C. H. ; 331 27th Street, Hermosa Beach, Calif., U.S.A.
- 1935 MERCK, Dr. WOLFGANG ; Rupert Strasse 55, Hamburg-Nieustedten, Germany.
- 1959 METZ, A. C. ; Ruys de Perezlaan 15, Aerdenhout, Holland.
- 1956 MEYERS, DUDLEY C. ; 46 Dyke Road, Brighton, Sussex.
- 1960 MICHELL, GEOFFREY R. ; 3 Hill Street, Mitcham, South Australia.
- 1953 MIDDLETON, L. G., B.Sc.Tech., A.M.I.Struct.E. ; The Old Vicarage, Churchtown, Nr. Garstang, Lancs.
- 1951 MIDWINTER, J. W. ; 62 Oxford Road, Burford, Oxford.
- 1956 MILFORD, B. F. ; 2 Fairway Avenue, Boreham Wood, Herts.
- 1957 MILLAR, IVAN G. ; 141 Seventh Avenue, Royston Park, South Australia.
- 1958 *MILLER, DOUGLAS SCOTT, M.A.O.U. ; 122 Lawrence Avenue East, Toronto, Ontario, Canada.
- 1960 MILLER, PETER E. ; Abbotshay Farm, Ayot St. Lawrence, Welwyn, Herts.
- 1960 MILLER, Mrs. PETER E. ; Abbotshay Farm, Ayot St. Lawrence, Welwyn, Herts.
- 1950 MILLER, R. C. ; c/o Standard Bank of South Africa, Ltd., Pietermaritzburg, Natal, S. Africa.
- 1937 MILLIGAN, H. ; Upper Manor Farm, Leckford, Stockbridge, Hants.
- 1951 MILLIGAN, I. B. ; 5 Silsey Avenue, Sale, Cheshire.
- 1956 MILNE, L. THORNTON, M.A.(Agric.) Cantab ; Lower Coombe Farm, East Allington, Nr. Totnes, S. Devon.
- 1929 MILNES-COATES, Capt. Sir CLIVE, Bart., O.B.E., F.Z.S. ; 13 Hyde Park Gate, London, S.W. 7.
- 1959 MILON, Colonel PH. E. ; 4 Rue de la Pompe, Paris 16^e, France.
- 1958 MILWARD, VICTOR G. ; P.O. Box 99, Lilongwe, Nyasaland.
- 1959 MINNITT, Mrs. E. M. ; 73 Kremlin Drive, Stoneycroft, Liverpool 13.
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- 1943 MITCHELL, HAROLD A. ; 2 Stuart Street, East Kilbride, Lanarkshire.
- 1952 MITCHELL, R. E. ; 49 Woodlands Avenue, Church End, Finchley, N. 3.
- 1950 MITCHELL-FOX, Mrs. E. M. ; Tresawle, Wheatridge Lane, Livermead, Torquay, Devon.
- 1956 MIYAKE, MASAMI ; P.O. Box 11, Kakogawa-shi, Hyogo-ken, Japan.
- 1958 MOIR, J. ; 8 Hill Crescent, Blackley, Manchester 9, Lancs.
- 1926 MOODY, A. F. ; Lilford, Oundle, Peterborough.
- 1958 *MOORE, The Rev. C. E., M.A. ; The Vicarage, Holmrook, Cumberland.
- 1957 MOORE, D. R. ; Roselea, Leven Road, Yarm, Yorks.
- 1950 MOORE, J. T. ; 17 Gold Street, Wellingborough, Northants.
- 1955 MORELL, Mrs. G. ; 54 Chesterfield House, London, W. 1.
- 1954 MORGAN, Mrs. A. ; 38 Inham Road, Chilwell, Notts.
- 1958 MORGAN, R. J. ; 36 Fox Road, Whipton, Exeter.
- 1949 MORNY, C. J. ; 52 Draycott Place, London, S.W. 3.
- 1931 MORRISON, A. R. G., F.Z.S., M.B.O.U. ; c/o Chartered Bank of India, Australia and China, Kuching, Sarawak.
- 1956 MORTON, The Rev. NEVILLE ; 38 Tempest Avenue, Darfield, Nr. Barnsley, Yorks.
- 1960 MORTON, OSBORNE ; Old Forge House, Malone Road, Belfast, N. Ireland.
- 1959 MOSER, GEORGE F. ; 106 Church Lane, Cheshunt, Herts.
- 1947 MOSFORD, FRANK ; The Elms, Churton Heath, Saughton, Nr. Chester.
- 1956 MOSHEIM, E. ; 7 Gardiner Road, Hawthorn, Victoria, Australia.

- 1929 MOTTERSHEAD, G. S., F.Z.S. ; The Zoological Gardens, Chester.
- 1960 MOTTEE, H. ; Wedderburn, Via Campbelltown, N.S.W., Australia.
- 1923 MOUNTAIN, Capt. WALTON ; Groombridge Place, Groombridge, Kent.
- 1959 MÜHRING, K. J. ; Zuidzjde 78a, Polsbroek, Holland.
- 1959 MUIR, ANDREW, JR. ; 10 Cotton Street, Castle Douglas, Kirkcudbrightshire, Scotland.
- 1956 MUIRHEAD, D. W. ; 23 Somerleyton Street, Unthank Road, Norwich, Norfolk.
- 1956 MULCAHY, S. ; 21 Roberts Road, Haddenham, Nr. Aylesbury, Bucks.
- 1957 MULLER, ROLAND A. ; Box E., Santee, Calif., U.S.A.
- 1959 MURPHY, TERENCE ; The Royal Zoological Society of Ireland, Phoenix Park, Dublin, Eire.
- 1947 MURRAY, H. ; Bracken, Cornsland, Brentwood, Essex.
- 1952 MURRAY, J. B. ; 115 Avenue de l'Opale, Brussels, 4, Belgium.
- 1939 *MURRAY, R. J. ; 12 High Road, Camberwell E. 6, Victoria, Australia.
- 1949 MURRAY, SAMUEL, F.Z.S. ; 18 Somerset Gardens, Lewisham, S.E. 13.
- 1960 MCCARTHY, BARRY E. ; 49 Humphrey Street, New Norfolk, Tasmania, Australia.
- 1926 *McCULLAGH, Sir CRAWFORD, Bart. ; Lismara, Whiteabbey, Belfast, N. Ireland.
- 1960 McDANIELS, Mrs. VELMA ; 2427 W. 251st Street, Lomita, Calif., U.S.A.
- 1960 McDONALD, JOHN E. ; Box 135, Winkie, South Australia.
- 1960 McDougall, RAYMOND W. ; 9 Glass Street, East Kew E.5, Victoria, Australia.
- 1959 McGLASHAN, R. P. R. ; c/o Shell Co. of W.A., Ltd., Private Mail Bag 2052, Lagos, Nigeria.
- 1956 McGRATH, JOSEPH J. ; Curragh Grange, Curragh, Co. Kildare, Eire.
- 1959 McGREGOR, Mrs. W. E. ; Rua Baraõ de Guaratiba 229, Rio de Janeiro, Brazil.
- 1953 McHALE, J. P. ; 1526 W. Highland Avenue, Chicago 26, Ill., U.S.A.
- 1960 McILROY, J. REA ; 1 Dundela Gardens, North Road, Belfast 4, N. Ireland.
- 1959 McKEAN, JOHN L. ; M.R.A.O.U. ; 5 Hoyt Street, Hampton S.7, Victoria, Australia.
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- 1950 McKENZIE, D. L. ; The New Inn, Winchelsea, Sussex.
- 1959 McKIBBIN, JOHN S. ; 34 Spruce Street, Low Road, Lisburn, N. Ireland.
- 1955 McLACHLAN, G. R. ; Museum and Snake Park, 28 Bird Street, Port Elizabeth, S. Africa.
- 1955 McLEAN, A., B.Sc., M.R.C.V.S., D.V.H., F.R.S.I. ; Bellevue Zoological Gardens, Belfast, N. Ireland.
- 1959 McLURE, ERNEST A. ; 2 McIntyre Avenue, Brighton le Sands, N.S.W., Australia.
- 1960 NAEGEL, RICHARD G. ; c/o Anheuser-Busch, Inc., 3000 Temple Terrace Highway, Tampa 4, Florida, U.S.A.
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- 1960 NEWCOMBE, A. J. ; 15 Hillary Road, Basingstoke, Hants.
- 1952 NEWELL, J. P., Ph.C., M.P.S.I., D.Opt., M.I.O.S. ; 4 Pearse Street, Athlone, Eire.
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 1948 NOORDZIJ, J. H. ; Amersfoortscheweg 14, Maarn, Holland.
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 1960 OXLEY, R. E. ; 69 Leadale Avenue, Chingford, London, E. 4.
 1953 OZANNE, H. W. H. ; Le Mouillage, Rue de la Grande Maison, St. Peter in the Wood, Guernsey, C.I.
- 1956 PAGE, Mrs. B. V. ; "Greenanore," West Riding, Tewin Wood, Welwyn, Herts.
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- 1960 PALMER, D. F. ; "Ettune," 9 Judges Drive, Norwich, Norfolk.
- 1957 PALMER, H. G. ; "The Shrubbery," 115 Roman Road, Birstall, Leics.
- 1955 PALSSON, W. F. ; Halldorsstadir, Laxardal, via Husavik, Iceland.
- 1950 PANTING, PETER J., B.Sc., F.Z.S. ; Y Felin Isaf, Drim, Dyffryn, Goodwick, Pembro.
- 1957 PAPÉ, T. V. F., F.Z.S. ; "Hollington," 162 Kimbolton Road, Bedford.
- 1960 PAPIERNIK, JOHN ; *World Avifauna Directory*, 440 Sinclair Street, Winnipeg 4, Manitoba, Canada.
- 1954 PARIS, P. G. ; Boskenna, St. Buryan, Cornwall.
- 1958 PARKEN, DERRICK ; P.O. Box 1058, Englewood, Florida, U.S.A.
- 1957 PARKER, G. N. W. ; P.O. Box 938, Port Elizabeth, South Africa.
- 1956 PARKES, K. C., Ph.D., M.B.O.U. ; Carnegie Museum, Pittsburgh 13, Pennsylvania, U.S.A.
- 1952 PARTRIDGE, P. B. ; 164 Waverley Avenue, Twickenham, Middx.
- 1934 PARTRIDGE, W. R., F.Z.S. ; The Bungalow, Lower Haselor, Nr. Evesham, Worcs.
- 1960 PASLEY-TYLER, Commander H., R.N.(Retd.) ; Coton Manor, Guilsborough, Northamptonshire.
- 1960 PATON, R. W. L. ; "Hollycroft," 108 Kenilworth Road, Coventry.
- 1949 PAYN, W. H., M.B.E., M.B.O.U. ; Hartest Place, Bury St. Edmunds, Suffolk.
- 1950 PAYNE, C. M., F.Z.S. ; The Malt House, Barford, Warwick.
- 1955 PAYNE, Mrs. C. M. ; The Malt House, Barford, Warwick.
- 1959 PEARL, Dr. ALLEN S., Jr. ; 2443 N. Burling Street, Chicago 14, Ill., U.S.A.
- 1957 PEARSON, CHARLES J. ; 685 N. Helena Street, Anaheim, Calif., U.S.A.
- 1957 PEARSON, H. E. ; Pearson's Bird and Animal Farm, Southbury, Conn., U.S.A.
- 1958 PEARSON, Mrs. M. FORBES ; The County Hotel, Abington Avenue, Northampton.
- 1940 PEAT, RODERICK M., F.Z.S. ; Chaureth Hall Farm, Broxted, Nr. Dunmow, Essex.
- 1958 PEMBERTON-ENGLISH, JACK ; P.O. Box 36, Tanah Rata, Cameron Highlands, Malaya.
- 1960 PEÑA, LUIS E. ; Casilla 2974, Santiago, Chile.
- 1960 PENWARDEN, K. L. ; 10 Cumnor Court, Main Road, Kenilworth, Cape Town, South Africa.
- 1959 PEREIRA, MANUEL DE CASTRO ; Rua D. João V-31-1º, Esquerdo, Lisboa, Portugal.
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- 1953 PERRY, J. A. W. ; 14 New Way, Pinelands, Nr. Cape Town, S. Africa.
- 1956 PETERS, Mrs. MARGARET F. ; Plashett Park Farm, Ringmer, Nr. Lewes, Sussex.
- 1957 PETTENGILL, DAVID G. ; 518 N. First Street, Libertyville, Ill., U.S.A.
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- 1958 PHILLIPS, D. H. G. ; The Croft, 27 Shirley Drive, Hove, Sussex.
- 1954 PHILLIPS, Miss R. F. ; 488 Shirley Road, Hall Green, Birmingham 28.
- 1935 PHIPPS, Mrs. L. N., F.Z.S., ; The Manor House, Minster Lovell, Oxon.
- 1954 PILCHER, R. E. M., M.A., F.R.C.S. ; The Meadows, 39 Spilsby Road, Boston, Lincs.
- 1934 PITT, W. S. ; Wildwood, Silverdale Avenue, Walton-on-Thames, Surrey.
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- 1960 PLOSE, M. J. ; 3 Fawnbrake Avenue, Herne Hill, London, S.E. 24.

- 1956 PLUMB, T. R. ; The Tropical Shop, 376 Stretford Road, Manchester, 15.
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- 1958 QUICK, E. A. ; 19 Delville Avenue, Durban, Natal, South Africa.
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- 1957 RADTKE, ELDON ; 716 Henry Street, Peru, Ill., U.S.A.
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 1950 REES, F. A. D. ; Leckford, Stockbridge, Hants.
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 1959 REITZ, F. H. H. ; Headkeeper's House, Dudley Zoo, The Broadway, Dudley, Worcs.

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- 1957 REYNOLDS, S. A. ; P.O. Box 1055, Victoria, British Columbia, Canada.
- 1959 RICE, JOHN G. ; P.O. Box 34, Wyoming, Ontario, Canada.
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- 1949 RICHARDSON, JAMES ; Spencer House, 101 Stockton Lane, York.
- 1959 RICHARDSON, R. A. ; Hill-Top, Cley, Holt, Norfolk.
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- 1954 RIGGE, J. S. ; Old Broadgate, Millom, Cumberland.
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- 1937 *RIPLEY, S. DILLON, Ph.D., M.B.O.U. ; Kilravock, Litchfield, Conn., U.S.A.
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- 1956 ROBINSON, Mrs. J. E., F.Z.S. ; Flat One, 63 Nightingale Lane, Balham, London, S.W. 12.
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- 1959 ROCHFORD-BOYD, Mrs. C. ; Couchman Green, Staplehurst, Kent.
- 1959 RODDIS, H. ; 42 Ripon Road, Stretford, Lancs.
- 1952 RODGERS, J. ; 39 Fore Street, Totnes, Devon.
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- 1957 ROHRLACH, M. L. ; 12 Harrow Road, Somerton Park, Adelaide, South Australia.
- 1955 ROKOSKY, EMIL J. ; Racine Zoological Society, 2131 North Main Street, Racine, Wis., U.S.A.
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- 1945 ROONEY, JAMES P., M.B.O.U. ; 1514 South 12th Avenue, Yakima, Washington, U.S.A.
- 1954 ROSE, W. H. ; Hill Cottage, Lubenham Hill, Market Harborough, Leics.
- 1954 ROSSITER, Dr. N. A. ; 1117 Colonial Mutual Bldg., West Street, Durban, Natal, S. Africa.
- 1953 ROTERS, J. ; c/o W. B. Plannt and Son, Ltd., Webbwood, Ontario, Canada.
- 1954 ROTHWELL, Dr. K. G. ; 49 Lutterworth Road, Leicester.
- 1954 ROUILLARD, J. V. ; P.O. Box 72, Stanger, Natal, S. Africa.
- 1956 ROUSE, O. ; "Mirasol," Frithwood Lane, Billericay, Essex.
- 1951 ROYDEN, T. W. E. ; Broad House, Fleggburgh, Norfolk.
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- 1950 RUSSELL, BARNABAS, F.R.S.A., F.Z.S., F.R.H.S. ; 20 Bucklersbury, Hitchin, Herts.
- 1958 RUSSELL, FRANK ; c/o Ward Park, Bangor, Co. Down, N. Ireland
- 1956 RUSSELL, K. ; "Rafso Cottage," Outwell, Nr. Wisbech, Cambs.
- 1960 RUSSELL, R. ; 1 Kennford Road, Gillmoss, Liverpool 11.
- 1954 RUTGERS, A. ; Verzetslaan 5, Warnsveld, Holland.
- 1957 RYAN, Mrs. EMILY ; 245 West 51st Street, New York City 19, N.Y., U.S.A.
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- 1954 SALMON, W. G. ; Angley Lake, Cranbrook, Kent.
- 1956 SALTER, Miss G. ; "The Flat," Primley House, Paignton, Devon.

- 1960 SANDERS, M. H. ; 1642 So. Ogden Drive, Los Angeles 19, Calif., U.S.A.
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 1945 SAUNDERS, RONALD, F.Z.S. ; 1 Regent Parade, Sycamore Road, Amersham, Bucks.
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 1956 SCOURFIELD, J. G. ; 6 Oakland Avenue, Dialstone Lane, Stockport, Cheshire.
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 1960 SHAPIRO, Dr. S., B.S.D. (Rand) ; 513 Harley Chambers, 187 Jeppe Street, Johannesburg, South Africa.
 1958 SHARP, C. ; Federation of Malaya Customs Duties Collection Station, Private Bag, Singapore.
 1954 SHARPE, W. G. ; The Grove, Church Road, Flitwick, Bedford.
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- 1953 SHOLAR, N. P., D.D.S. ; P.O. Box 180, Mooresville, N.C., U.S.A.
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- 1956 SIMÕES, FRANCISCO JOSÉ ; Quinta das Terras, Pinheiro de Loures, Portugal.
- 1953 SIMÕES, JOAQUIM FREITAS ; L. do Conde Barão 5, Lisboa 2, Portugal.
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- 1957 SLACK, E. E. ; Ivanhoe House, 28 Thompson Street, Langley Mill, Notts.
- 1947 SLADER, W. T., J.P. ; Pentillie, Honiton Road, Exeter.
- 1956 SLATER, C. ; 12 Moorland View, Gleadless, Sheffield 12.
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- 1954 SMART, T. E. ; Castlemead, Tenbury Wells, Worcs.
- 1959 SMEATON, R. H. ; P.O. Box 2, Sesheke, Barotseland, Northern Rhodesia.
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- 1957 SMITH, A. R. S. C., F.Z.S. ; 17 Eastfield Avenue, Wellshot, Cambuslang, Lanarkshire.
- 1941 SMITH, E. WILFORD ; "Glen Oaks," 30 Oaks Road, Great Glen, Leicestershire.
- 1954 SMITH, FRANK ; 12 Nabs Head Lane, Samlesbury, Nr. Preston, Lancs.
- 1960 SMITH, FRANCIS L. ; Strathaven, West End, Redruth, Cornwall.
- 1960 SMITH, GEORGE A., M.R.C.V.S. ; 39 Berkeley Road, Peterborough, Northants.
- 1960 SMITH, J. O. ; Church Road, Freiston, Boston, Lincs.
- 1947 SMITH, KENNETH J., F.Z.S. ; Jersey Zoo Park, Les Augrés Manor, Trinity, Jersey, Channel Islands.
- 1959 SMITH, LINDSAY C. ; 13 Le Hunte Avenue, Prospect, South Australia.
- 1960 SMITH, REGINALD DAVID ; Sarson Farm, Sarson Lane, Weyhill, Nr. Andover, Hampshire.
- 1955 SMITH, R. G. ; 16 Walton Gardens, Shenfield, Brentwood, Essex.
- 1959 SMITH, R. R. ; "Stayesmore Manor," Carlton, Beds.
- 1917 SMITH, Sir WILLIAM PROCTER, F.Z.S. ; Bexton House, Knutsford, Cheshire.
- 1953 SNAZLE, H. A., M.B.E., F.Z.S. ; Chessington Zoo, Ltd., Leatherhead Road, Chessington, Surrey.
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- 1950 SOAR, E. R. ; 233 Long Lane, Hillingdon, Middx.
- 1959 *SOMERS, Colonel KENNETH ; Ophthalmic Dept., Walter Reed Hospital, Washington 12, D.C., U.S.A.
- 1957 SOVERA, AMEDEO ; Hotel Maree Pineta, Cervia (Ravenna), Italy.
- 1952 SPEED, Mrs. D. A. ; 207 No. Locan Avenue, Fresno 2, California, U.S.A.
- 1952 SPENCE, T., M.R.C.V.S., F.R.Z.S.(Scot.) ; Dunbog, Newburgh, Fife, Scotland.
- 1953 SPILSBURY, D. T. ; "Withersfield," 5 Lambourne Avenue, Malvern Link, Worcs.
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- 1958 SPOONER, WILLIAM C. H. ; "Avian Towers," 59 Shaw Lane, Stoke Prior, Nr. Bromsgrove, Worcs.
- 1958 SPRINGTHORPE, W. L. ; "White Wings," 29 Whitehall Road, Lower Wyke, Bradford.
- 1923 SPURWAY, N. B. ; "The Hermitage," Oadby, Leicestershire.
- 1939 SQUIRE, E. O. ; Bassmead, St. Neots, Hunts.
- 1960 STAUB, DR. CHARLES ; Hinwil, Zürich, Switzerland.
- 1956 STEEL, NEWTON R., N.D.A. ; The Hookland Estate, Scaynes Hill, Haywards Heath, Sussex.
- 1954 *STEPHAN, H. C. ; "Hathersage," Gordons Road, Somerset West, C.P., S. Africa.
- 1959 STEPHENSON, G. H. ; "Sunnyholme," 11 Spilsby Road, Wainfleet, Skegness, Lincs.
- 1953 STEVENS, A. ; 56 Gwencole Crescent, Braunstone, Leicester.
- 1932 STEVENS, RONALD ; Fermoyle Lodge, Costello, Co. Galway, Eire.
- 1958 STILWELL, Major M. W., M.C. ; Avenida Antonio Augusto de Aguiar 30/1^o E., Lisbon, Portugal.
- 1953 STIVEN, H. ; c/o Shell Co. of W.A., Ltd., P.M.B. 2052, Lagos, Nigeria.
- 1960 STOATE, N. R. ; Cann Mills, Shaftesbury, Dorset.
- 1959 STODDART, F. W. ; West Minley Farm, Blackwater, Camberley, Surrey.
- 1952 STODDART, R. W. ; Grey Lynn, Flatts Lane, Normanby, Nr. Middlesbrough, Yorks.
- 1960 STOK, LEO ; Lot 16, Norman Street, East Doncaster, Australia.
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- 1922 STOKES, Capt. H. S., M.C., F.Z.S. ; 66 Dartmouth Road, Paignton, S. Devon.
- 1960 STONE, WALTER D. ; Director, Franklin Park Zoological Gardens, Boston 21, Mass., U.S.A.
- 1929 STONEY, Miss I. ; Central Lodge, 55 Central Hill, Upper Norwood, London, S.E. 19.
- 1957 STOWERS, JHÔN E. ; Fairholme, Roskear, Camborne, Cornwall.
- 1948 STRANGE, FRANK E. ; P.O. Box 207, Redondo Beach, California, U.S.A.
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- 1949 STRUTT, Hon. PETER A. ; Bentley Park, Ipswich, Suffolk.
- 1957 STUCKEY, G. ; 69 Mimms Hall Road, Potters Bar, Middx.
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- 1950 SWAN, Mrs. J. A. ; Hazel Mere, Rectory Lane, Sidcup, Kent.
- 1958 SWIFFEN, J. D. ; Hareway House, Barford, Warwick.
- 1958 SWIFT, J. H. ; 83 Alderbrook Road, Solihull, Warwickshire.
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 1959 TESSIER-YANDELL, J. ; c/o National and Grindlays Bank, Ltd., Church Lane, Calcutta, India.
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 1957 THOMSON, T. R. ; Woodbrae, 61 John Street, Penicuik, Midlothian, Scotland.
 1959 THOMSON, DR. W. S. ; The Firs, 223 London Road, Leicester.
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 1956 TILLEY, R. G. L. ; 45 Rue Calamine, Stembert, Verviers, Belgium.
 1954 TIMMIS, W. H., F.Z.S. ; Jersey Zoological Park, Les Augres Manor, Trinity, Jersey, C.I.
 1946 *TINSLEY, PATRICK C. ; Hurn Hall, Holbeach, Spalding, Lincs.
 1946 *TINSLEY, WILLIAM G. ; The Poplars, Holbeach, St. Marks, Lincs.
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- 1960 TRIGG, Major J. H., R.E. ; " Rotherhurst," St. Mary's Road, Liss, Hants.
- 1952 TROUBRIDGE, Lady ; Middle Oakshott, Hawkey, Liss, Hants.
- 1947 *TUCKWELL, DAVID ; Asliesk, Alves by Forres, Morayshire.
- 1939 TUNESI, A. W. ; 10 Burgoyne Road, Sunbury-on-Thames, Middx.
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- 1957 TYLER, H. H. ; 74 Ditmas Avenue, Kempston Hoo, Beds.
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- 1954 *ULLENS DE SCHOOTEN, C. A., F.Z.S. ; Les Bouleaux, Quatre-Bras, Crainhem, Brabant, Belgium.
- 1959 ULRICH, Dr. JOÃO DE MELLO ; Rua Dr. António Martins 5, Estoril, Portugal.
- 1956 UNDERWOOD, Sgt. F. W. ; R.N.Z.A.F., Te Rapa, Hamilton, New Zealand.
- 1955 UPTON, Mrs. P. V., F.Z.S., M.B.O.U. ; Park Lodge, Margaretting, Ingatestone, Essex.
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- 1960 VANBRABANT, WILFRIED ; Koningin Astridlaan No. 1, Bottelare, Belgium.
- 1958 VAN CLEVE, G. BERNARD ; 323 S. Fairmount Street, Pittsburgh 32, Pa., U.S.A.
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- 1949 VAN DEN BERGH, WALTER, C.M.Z.S., C.M.R.Z.S.(Scot.) ; Société Royale de Zoologie d'Anvers, 26 Place Reine Astrid, Antwerp, Belgium.
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- 1956 VAN DIJK, C. ; Avicentra, Schilde, Antwerp, Belgium.
- 1950 VAN DIJK, H. C. ; Fabriekstraat 6, Tilburg, Holland.
- 1948 VAN DIJK, H. J. ; Animali, Eindhoven, Holland.
- 1950 VAN DIJK, N. ; Bisschop Aelenstraat 50, Tilburg, Holland.
- 1934 VAN HEYST, A. F. C. A. ; No. 12, Plesmanlaan, Bussum, Holland.
- 1956 VAN HEYST, H. P. ; Huize " de Kimpenkamp," Groenlo, Holland.
- 1950 VAN LEEUWEN, J. DOCTERS ; Hoveniersweg 37, Tiel, Holland.
- 1955 VAN MAARION, W. J. ; Nelson Aviaries, 715—6th Street, Nelson, British Columbia, Canada.

- 1960 VAN MALTSBERGER, G. ; 2013 Belknap Place, San Antonio 12, Texas, U.S.A.
- 1953 VAN OOSTEN, J. R., M.B.O.U. ; 801 N. Yakima, Tacoma, Washington, U.S.A.
- 1959 VAN RENTERGHEM, A. W. ; Vredehofstraat 50, Rotterdam, Holland.
- 1951 VAN VOLLENHOVEN, P. ; Burgem Knappertlaan 128, Schiedam, Holland.
- 1951 VAN WACHEM, R. H. ; Joh. Geradtsweg 44, Hilversum, Holland.
- 1937 VANE, E. N. T., F.Z.S. ; Fairacre, Chiltern Road, Ballinger, Gt. Missenden, Bucks.
- 1959 VANE, Mrs. H. M. ; Fairacre, Chiltern Road, Ballinger, Gt. Missenden, Bucks.
- 1955 VELD, S. A. MAN IN'T ; "Eikenoord," Deventerstraat 494, Apeldoorn, Holland.
- 1959 VELDT, L. G. ; K.R.Z.V. "De Maas," Veerdam 1, Rotterdam, Holland.
- 1956 VERMET, D. ; Landgoed "Zoomland," Bergen op Zoom, Holland.
- 1928 VIERHELLER, GEORGE P. ; St. Louis Zoological Park, St. Louis 10, Mo., U.S.A.
- 1957 VINE, K. N. R. ; 105 Austhorpe Lane, Crossgates, Leeds 15.
- 1947 VINSON, MARK ; Shute Cottage, Kellaton, Kingsbridge, S. Devon.
- 1954 VLEMMIX, H. P. ; "Simba" Vogels en Dieren, Bisschop Zwijsenstraat 116, Tilburg, Holland.
- 1957 VOWLES, R. A. ; Paston Lodge, Sway Road, Brockenhurst, Hants.
- 1936 VOY, Miss HILDA ; Lynchets, Longbridge Deverill, Warminster, Wilts.
- 1948 VUCOVICH, PAYSON ; 15731 Fargo Avenue, Hanford, California, U.S.A.
- 1957 *WADE, OTIS ; 1806 Redesdale Avenue, Los Angeles 26, Calif., U.S.A.
- 1960 WADLER, WILLIAM ; Odengatan 86^{II}, Stockholm Va., Sweden.
- 1957 WAGNER, Mrs. CATHERINE ; 18142 Archwood Street, Reseda, Calif., U.S.A.
- 1955 WAHLGREN, J. O. ; 24 Garth Road, Kingston-on-Thames, Surrey.
- 1947 WAIT, F. R., F.Z.S. ; "Thorneycroft," 17 Hillway, Woburn Sands, Bucks.
- 1952 WAITE, J. ; 6 Attwood Street, Kidsgrove, Staffs.
- 1948 WAKEFIELD, Mrs. C. H. ; 1437 Alameda de las Pulgas, Redwood City, Calif., U.S.A.
- 1958 WALDEN, J. J. ; Chambers' Nurseries, Nevendon Road, Wickford, Essex.
- 1959 WALKER, G. R. ; Woodland Cottage Farm, Hinton St. Michael, Nr. Christchurch, Hants.
- 1957 WALKER, J. A. ; Inchcross Farm, Bathgate, West Lothian, Scotland.
- 1959 WALLACE, H. ; 6 Palmers Avenue, Grays, Essex.
- 1936 WALLER, H., F.Z.S. ; Oldway, Pilgrims Way, Westhumble, Dorking, Surrey.
- 1951 WALLIN, Mrs. O. H. ; 11543-36th N.E., Seattle 55, Washington, U.S.A.
- 1959 WALSH, JOHN J. ; 28 Young Street, Drouin, Victoria, Australia.
- 1957 WARD, B. L. ; Washway Road, Holbeach, Nr. Spalding, Lincs.
- 1957 WARFORD, Dr. FREDERICK S. ; Rm. 1512, Medico-Dental Building, 490 Post Street, San Francisco 2, Calif., U.S.A.
- 1956 WARNER, Mrs. JEAN S. ; 21 Hope Terrace, Edinburgh 9.
- 1960 WARWICK, GEORGE P. ; 2 Milner Mount, Penrith, Cumberland.
- 1952 WASTELL, C. H. ; "Ewan" House, Langbury Lane, Ferring-by-Sea, Worthing, Sussex.
- 1956 WATERSTON, G., F.R.S.E., F.R.Z.S.(Scot.), M.B.O.U. ; 21 Regent Terrace, Edinburgh 7.
- 1958 WATKINS, IRVINE B. ; Phelps Dodge Copper Products Corporation, 505 North Rome Ave., Tampa 6, Florida, U.S.A.

- 1932 WATKINS, T. R. HOLMES ; Oronsay, The Ellipse, Griffithstown, Mon.
 1956 WATMOUGH, W. E. G., F.Z.S. ; Lintonholme, Crag Lane, Rigton, Huby,
 Leeds.
- 1953 WATSON, ALEX ; 24 River Street, Brechin, Angus, Scotland.
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 1955 WAYRE, P. L., F.Z.S., M.B.O.U. ; Hawks Hill, Great Witchingham,
 Norwich.
- 1956 WEBSTER, J. H. ; Ashgrove, Knockholt Pound, Nr. Sevenoaks, Kent.
 1959 WEEKS, J. G. ; 74 Richmond Street, Krugersdorp, Transvaal, South
 Africa.
- 1960 WEI-CHING, LAO., M.B.O.U. ; 25 Carnarvon Road, 3rd Floor,
 Tsimshatsui, Kowloon, Hong Kong.
- 1950 WEINMAN, Major A. N., O.B.E., C.M.Z.S. ; The Zoological Gardens of
 Ceylon, Allan Avenue, Dehiwela, Colombo, Ceylon.
- 1960 WELLS, Dr. DOLPH T., M.D. ; 3201 South Gevers, San Antonio 12, Texas,
 U.S.A.
- 1947 WEST, DAVID ; 209 N. 18th Street, Montebello, California, U.S.A.
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 Oxon.
- 1956 WESTON, J. T. Y. ; 4 Lynmouth Road, Leicester.
- 1932 WHARTON-TIGAR, Mrs. N., F.Z.S. ; Abbey Gate, Parry's Lane, Stoke
 Bishop, Bristol 9.
- 1950 WHEATLEY, Mrs. GRACE, R.W.S., F.Z.S. ; 57 Cadogan Place, London,
 S.W. 1.
- 1959 WHEELDON, JOHN GRAHAM ; Residential School, Llandrindod Wells,
 Radnor.
- 1956 WHEELER, ERIC R. ; St. Sebastien, Iberville County, Quebec, Canada.
 1947 WHEELER, T. E., F.Z.S. ; 5 Raymond Court, Mulgrave Road, Sutton,
 Surrey.
- 1947 WHEELER, Mrs. T. E., F.Z.S. ; 5 Raymond Court, Mulgrave Road, Sutton,
 Surrey.
- 1960 WHITE, Mrs. C. J. ; Hannaford House, Landkey, Barnstaple, N. Devon.
 1955 *WHITE, Dr. LAWRENCE F. ; 2125 Ocean Way, Laguna Beach, Calif.,
 U.S.A.
- 1953 WHITEHOUSE, N. V. ; 185 George Street, Brisbane, Queensland, Australia.
 1935 WHITMORE, G. E. ; 40 Charlemont Avenue, West Bromwich, Birmingham.
 1959 WHITSETT, D. D. ; 1343 Bancroft Street, Winston-Salem, N.C., U.S.A.
 1956 WICKLINE, LYLE ; 6603 King Avenue, Bell, California, U.S.A.
 1953 WICKS, Mrs. E. ; Silver Springs, Beaufort Road, St. Leonards-on-Sea,
 Sussex.
- 1931 WILCOCK, JOHN ; "The Chase," 259 Duffield Road, Allestree, Derby.
 1950 WILKINS, E. E. ; 52 Shenstone Road, Hollywood, Nr. Birmingham.
 1958 WILKINSON, J. W. ; 24 Crown Street, Rochdale, Lancs.
 1955 WILKINSON, N. ; "Four Ways," Biddulph Park, Biddulph, Stoke-on-
 Trent.
- 1957 WILLEM, FRANCQ ; Brusselbaan 33, Saint-Pieters-Leeuw (Post Ruisbroek),
 Belgium.
- 1957 WILLIAMS, B. M. ; Tyn-y-Bryn Estate, P.O. Box 72, Ruiru, Kenya Colony.
 1960 WILLIAMS, HAROLD G. ; 101 George Street, Scottsdale, Tasmania, Australia.
 1948 WILLIAMS, H. P. ; 2 Burcote Road, Pype Hayes, Birmingham 24.
 1956 WILLIAMS, J. P. ; The Old Farm, Tunstead, Norwich, Norfolk.
 1957 WILLIAMS, PETER O. ; "Northfield," Sherborne, Cheltenham, Glos.

- 1905**WILLIAMS, SIDNEY, F.Z.S. ; Millgarth, Nyewood Lane South, Bognor Regis, Sussex.
- 1950 WILLIAMS, T. J. ; Cartref, Sylva Gardens North, Craig-y-Don, Llandudno, N. Wales.
- 1951 WILLMOTT, J. D. ; Box 488, Mount Dora, Florida, U.S.A.
- 1948 WILLSHER, Mrs. G. A. ; 37 Springfield Road, Thornton Heath, Surrey.
- 1948 *WILSON, CALVIN D., M.A. ; Tracy Aviary, Liberty Park, 589 East 13th South, Salt Lake City 4, Utah, U.S.A.
- 1960 WILSON, EDMUND A. ; 10 Browns Road, East Bentleigh S.E. 15, Victoria, Australia.
- 1960 WILSON, E. O. ; 17 Kardella Street, East Malvern S.E. 5, Victoria, Australia.
- 1950 WILSON, G. ; Taormina, 25 Bushmead Road, Eaton Socon, St. Neots, Hunts.
- 1956 WILSON, J. B. ; Gartary Farm, Clackmannan, By Alloa, Scotland.
- 1958 WILSON, J. I. ; 510 Metropolitan Bank Building, 117 N.E. First Avenue, Miami 32, Florida, U.S.A.
- 1953 WINDECKER, Dr. W. ; Zoologischer Garten, Riehler Strasse 173, Köln-Riehl, Germany.
- 1960 WINDLE, HENRY ; 28 Gloucester Street, Prospect, South Australia.
- 1954 WINGATE, W. A. ; 7 Market Street, Winchester, Hants.
- 1958 WINGSTEDT, C. E. ; 71 Appledore Road, Gabalfa, Cardiff.
- 1959 WINSHIP, Mrs. J. M. ; 20930 Laguna Canyon Road, Laguna Beach, Calif., U.S.A.
- 1957 WISE, Major J. A. R. ; Tregye Farm House, Carnon Downs, Truro, Cornwall.
- 1956 WOLF, Miss P. K. ; Hanstead Stud, Weedon Hill, Aylesbury, Bucks.
- 1953 WOOD, G. ; 20 Forge Meads, Wittersham, Nr. Tenterden, Kent.
- 1945 WOOD, H. WALLACE ; Oak Hall, Hythe, Kent.
- 1940 WOOD, W. J. ; 61 Milson Road, Cremorne, Sydney, N.S.W., Australia.
- 1956 WOODHOUSE, S. ; 196 Jameson Avenue, Salisbury, Southern Rhodesia.
- 1958 WOODNUTT, JOHN G., F.I.Q.S., F.V.F., F.F.S. ; 35 Palace View, Shirley, Croydon, Surrey.
- 1957 WOODS, L. A. ; 56 Evans Street, Moonee Ponds, Victoria, Australia.
- 1957 *WOODS, S. H. ; 29 Craigwell Avenue, Aylesbury, Bucks.
- 1959 WRIGHT, JOHN ; 88 Portland Street, Accrington, Lancs.
- 1960 WRIGHT, M. K. ; "Heathrose," Wickham Bishops, Witham, Essex.
- 1950 WRIGHT, S. A., F.Z.S. ; 59 Ashridge Gardens, Palmers Green, London, N. 13.
- 1957 WYATT, KENNETH A. ; 3306 Newton Street, Torrance, Calif., U.S.A.
- 1934 YEALLAND, JOHN J., F.L.S., F.Z.S., M.B.O.U. ; The Zoological Society of London, Regent's Park, London, N.W. 1.
- 1959 YELLIS, TOM ; 623 N. Zeyn Street, Anaheim, Calif., U.S.A.
- 1956 YOUNG, D., M.R.C.V.S. ; "Pennants," Hollist Lane, Midhurst, West Sussex.
- 1960 YOUNG, T. L. ; 7 Sweetpool Lane, West Hagley, Worcs.
- 1959 ZUH-MING, DIEN ; No. 1, Lane 6, Yung Kang Street, Taipei, Taiwan (Formosa).
- 1960 VAN ZYL, GERRIT D. ; Married Quarter 41, Llewellyn Barracks, Bulawayo, Southern Rhodesia.

THE AVICULTURAL SOCIETY OF SOUTH AUSTRALIA (ADELAIDE)

LIST OF AFFILIATED MEMBERS

- AQUILINA, S. ; 30 Hart Street, Semaphore, South Australia.
 BARLOW, R. R. ; Cypress Terrace, Blackwood, South Australia.
 BREAKEY, A. ; Main Road, Hawthorndene, South Australia.
 BURFIELD, C. C. ; 12 Forest Avenue, Black Forest, Adelaide, South Australia.
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 CURL, W. S. ; 475 Grand Junction Road, Myrtleholme, South Australia.
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 HUTCHINSON, H. J. ; Coulls Road, Athelstone, South Australia.
 LONG, D. E. ; 20 Kyle Avenue, Glenside, South Australia.
 MANFIELD, H. ; c/o Zoological Gardens, Adelaide, South Australia.
 McKECHNIE, R. ; 6 Eric Street, Plympton, South Australia.
 SEPPELT, OSCAR ; 57 Northumberland Street, Tasmore, Adelaide, South Australia.
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- OHIO STATE UNIVERSITY ; Department of Zoology and Entomology, Botany and Zoology Building, Columbus 10, Ohio, U.S.A.
- QUEBEC ZOOLOGICAL GARDENS ; Orsainville, P.Q., Canada.
- ROYAL ZOOLOGICAL SOCIETY *Natura Artis Magistra.* ; Plantage Kerklaan 40, Amsterdam-C., Holland.
- ROYAL ZOOLOGICAL SOCIETY OF SCOTLAND, Murrayfield, Edinburgh 12.
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- TORONTO, UNIVERSITY OF ; LIFE SCIENCES DIVISION, ROYAL ONTARIO MUSEUM, 100 Queen's Park, Toronto 5, Ontario, Canada.
- ZOOLOGICAL BOARD OF VICTORIA ; Zoological Gardens, Parkville N. 2, Melbourne, Victoria, Australia.
- ZOOLOGICAL SOCIETY OF SAN DIEGO ; P.O. Box 551, San Diego 12, Calif., U.S.A.

Rules of the Avicultural Society

Last amended, 8th September, 1958.

1.—The name of the Society shall be THE AVICULTURAL SOCIETY, and its object shall be the study of British and foreign birds in freedom and in captivity. Poultry, domestic Pigeons, and Canaries shall be outside the scope of the Society. The year of the Society, with that of each volume of the Society's Magazine, which shall be known as the *Avicultural Magazine*, shall commence with the month of January and end on the 31st December following.

2.—The Avicultural Society shall consist of Ordinary, Life, Honorary Life Members, and Honorary Fellows, and the last shall be restricted in number to ten, and be elected by the Council.

3.—The Officers of the Society shall be elected, annually if necessary, by Members of the Council in the manner hereinafter provided, and shall consist of a President, one or more Vice-Presidents, a Secretary-Treasurer, an Assistant Secretary, an Editor, and a Council of fifteen Members. The President, Vice-Presidents, Secretary-Treasurer, Assistant Secretary, and Editor shall be *ex officio* Members of the Council.

4.—New Members shall be proposed in writing, and the name and address of every person thus proposed, with the name of the Member proposing him shall be published in the next issue of the Magazine. Unless the candidate shall within two weeks after the publication of his name in the Magazine, be objected to by at least two Members, he shall be deemed to be duly elected. If five Members shall lodge with the Secretary objections to any candidate he shall not be elected, but the signatures to the signed objections must be verified by the Scrutineer. If two or more Members shall object to any candidate the name of such candidate shall be brought before the Council at their next meeting, and the Council shall have power to elect or to disqualify him from election.

5.—Each Member shall pay an annual subscription of £1, to be due and payable in advance on the 1st of January in each year; and, on payment of the subscription shall be entitled to receive all the numbers of the Society's Magazine for the current year. Life Member's fee, £15.

6.—Members intending to resign their membership at the end of the current year of the Society are expected to give notice to the Secretary before the 1st of December, so that their names may not be included in the "List of Members", which shall be published annually in the January number of the Magazine.

7.—The Magazine of the Society shall be issued on or about the first day of every month, and forwarded, post free, *to all the Members who shall have paid their subscriptions for the year ; but no Magazine shall be sent or delivered to any Member until the annual subscription shall have reached the hands of the Secretary-Treasurer.* Members whose subscriptions shall not have been paid as above by the first day in November in any year shall cease to be Members of the Society, but may be readmitted, at the discretion of the Council, on payment of the annual subscription.

8.—The President, Secretary-Treasurer, Assistant Secretary, and Editor shall be elected for a term of five years, and, should a vacancy occur, it may be temporarily filled by the Executive Committee (see Rule 10). At the expiration of the term of five years in every case it shall be competent for the Council to nominate the same officer, or another Member, for a further term of five years, unless a second candidate be proposed by not less than twenty-five Members of at least two years' standing, as set forth below.

In the November number of the Magazine preceding the retirement from office of the President, Secretary-Treasurer, Assistant Secretary, and Editor, the Council shall publish the names of those members whom they have nominated to fill the vacancies thus created ; and these Members shall be deemed duly elected unless another candidate or candidates be proposed by not less than fifteen Members of at least two years' standing. Such proposal, duly seconded and containing the written consent of the nominee to serve, if elected, in the capacity for which he is proposed, must reach the Secretary on or before the 15th of November.

9.—The Members of the Council shall retire by rotation, three at the end of each year of the Society (unless a vacancy or vacancies shall occur otherwise) and three other Members of the Society shall be recommended by the Council to take the place of those retiring. The names of the three Members recommended shall be printed in the November number of the AVICULTURAL MAGAZINE. Should the Council's selection be objected to by fifteen or more Members, these shall have power to put forward three other candidates, whose names, together with the signatures of not less than fifteen Members proposing them, must reach the Secretary *by the 15th of November.* The names of the six candidates will then be printed on a voting paper and sent to each Member with the December number of the Magazine, and the result of the voting published in the January issue. Should no alternative candidates be put forward, in the manner and by the date above specified, the three candidates recommended by the Council shall be deemed to have been duly elected. In the event of an equality of votes the President shall have a casting vote.

If any Member of the Council does not attend a meeting for two years in succession the Council shall have power to elect another Member in his place.

10.—Immediately after the election of the Council that body shall proceed to elect three from its Members. These three, together with the Secretary-Treasurer, Assistant Secretary, and Editor, shall form a Committee known as the Executive Committee.

The duties of the Executive Committee shall be as follows :—

(i) In the event of the resignation of any of the Officers during the Society's year, to fill temporarily the vacancy until the end of the year. In the case of the office being one which is held for more than one year (e.g. Secretary-Treasurer, Assistant Secretary, or Editor) the appointment shall be confirmed by the Council at its next meeting.

(ii) To act for the Council in the decision of any other matter that may arise in connection with the business of the Society.

The decision of any matter by the Executive to be settled by a simple majority (three to form a quorum). In the event of a tie on any question, such question shall be forthwith submitted by letter to the Council for their decision,

The Executive shall not have power

- (i) To add to or alter the Rules;
- (ii) To expel any Member ;
- (iii) To re-elect the Secretary-Treasurer, Assistant Secretary, or Editor or a second term of office.

It shall not be lawful for the Treasurer to pay any account exceeding £10 unless such account be duly sanctioned by another Member of the Executive.

It shall be lawful for the Secretary-Treasurer or Editor to pledge the Society's credit for a sum not exceeding £100.

Should a Member wish any matter to be brought before the Council direct such matter should be sent to the Secretary with a letter stating that it is to be brought before the Council at their next meeting, otherwise communications will in the first place be brought before the Executive.

A decision of a majority of the Council, or a majority of the Executive endorsed by the Council, shall be final and conclusive in all matters.

11.—The Editor shall have an absolute discretion as to what matter shall be published in the Magazine (subject to the control of the Executive Committee). The Secretary and Editor shall respectively refer all matters of doubt and difficulty to the Executive Committee.

12.—The Council (but not a committee of the Council) shall have power to alter and add to the Rules, from time to time, in any manner they may think fit. Five to form a quorum at any meeting of the Council.

13.—The Council shall have power to expel any Member from the Society at any time without assigning any reason.

THE PRESIDENT'S MEDAL

The President's Medal was instituted in 1955 to enable the Council to confer conspicuous honour on those members whom it might from time to time consider deserving of special honour at the hands of the Society.

* * *

THE KNOBEL AWARD

The Knobel Award was instituted in 1960. It will be awarded from time to time, at the discretion of the Council, to members of the Society resident overseas, for breeding successes meriting special recognition.

* * *

CERTIFICATE OF MERIT

The Certificate of Merit was instituted in 1960. It will be awarded from time to time, at the discretion of the Council, to Zoological Societies, Pheasant and Waterfowl Trusts, etc., in recognition of meritorious success in breeding and rearing birds in captivity.

THE SOCIETY'S MEDAL

(*Instituted 1st November, 1896*)

RULES

The Medal may be awarded at the discretion of the Council to any Member who shall succeed in breeding, in the United Kingdom, any species of bird which shall not, in the opinion of the Council, be known to have been previously bred in captivity in Great Britain or Northern Ireland. Any Member wishing to obtain the Medal must send a detailed account for publication in the Magazine within about eight weeks from the date of hatching of the young, and furnish such evidence of the facts as the Council may require. The Medal will be awarded only in cases where the young shall live to be old enough to feed themselves, and to be wholly independent of their parents. The question of awarding a Medal for the breeding of local races or sub-species of species that have already been bred shall be at the discretion of the Council. No Medal can be given for the breeding of hybrids.

The account of the breeding must be reasonably full so as to afford instruction to our Members, and must appear in the *Avicultural Magazine* before it is published or notified elsewhere. It should describe the plumage of the young, and *be of value as a permanent record of the nesting and general habits of the species*. These points will have great weight when the question of awarding the Medal is under consideration.

In every case the decision of the Council shall be final.

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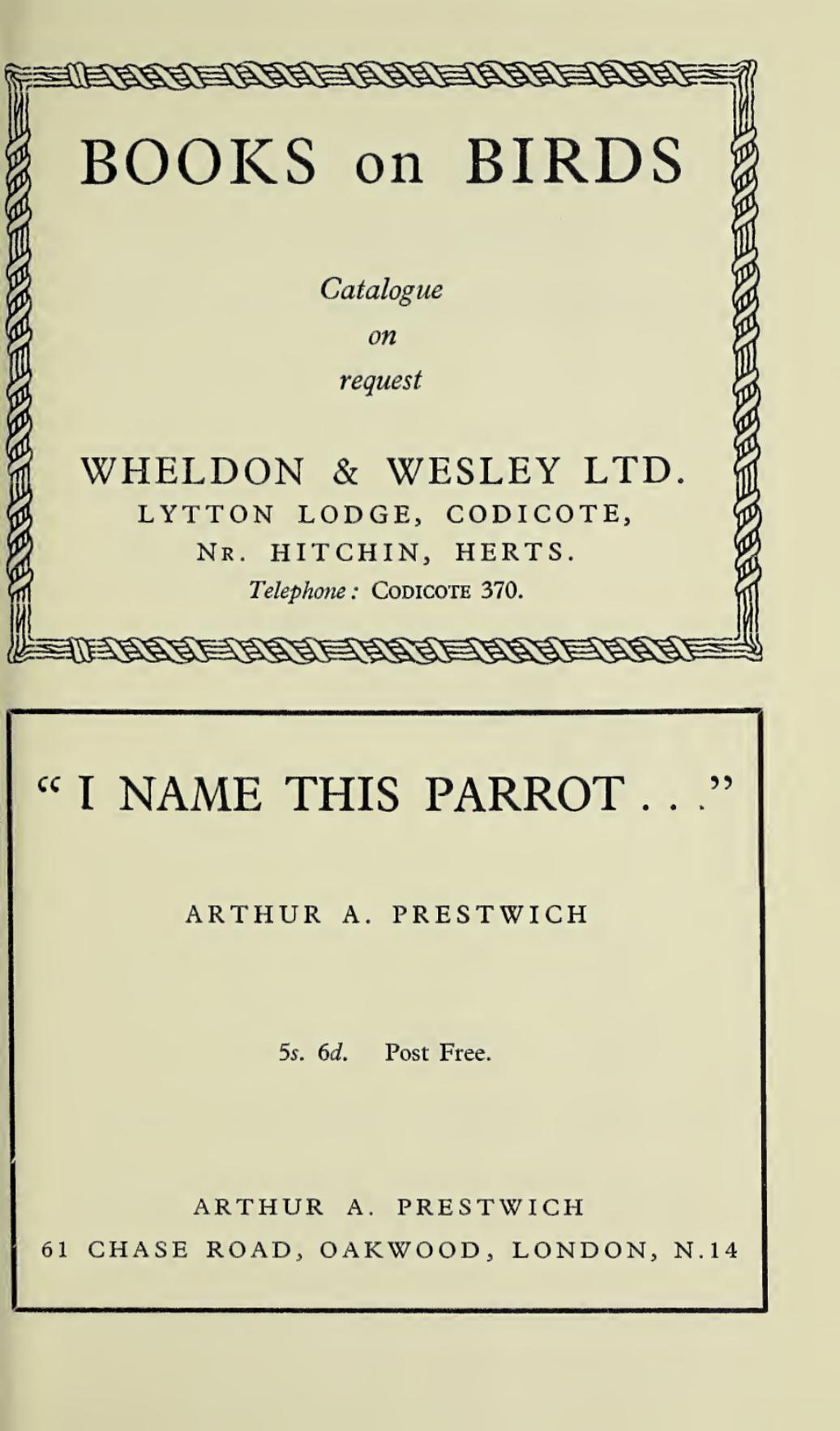
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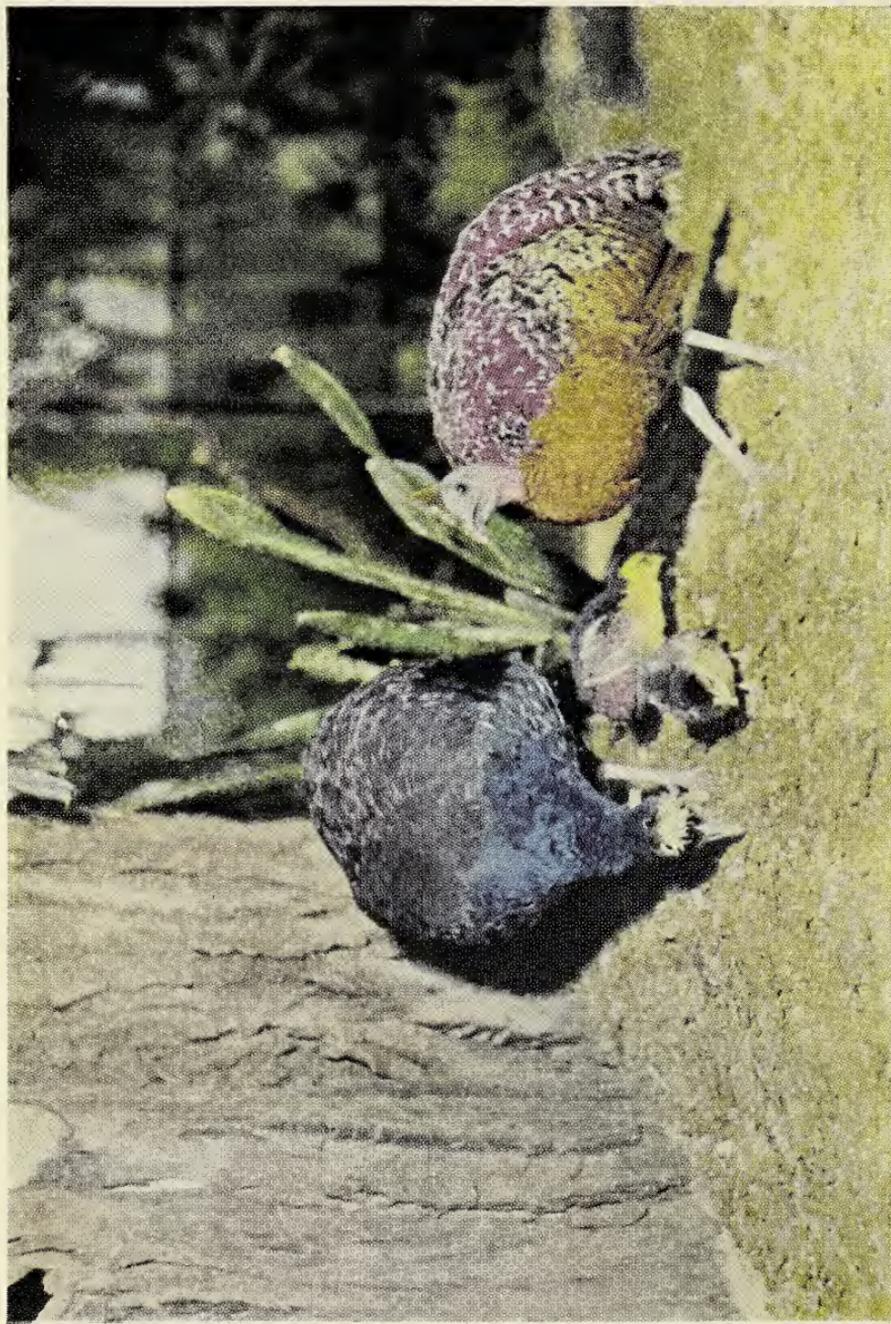
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CONGO PEACOCK, MALE AND FEMALE AND CHICKS TWO WEEKS OLD

AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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MARCH-APRIL, 1961

THE CONGO PEACOCK

(*Afropavo congensis* (Chapin))

By F. J. APPELMAN (The Hague, Holland)

In 1959 the Antwerp Zoo acquired three pairs of the Congo Peacock from Mr. Cordier. The Director, Mr. Van den bergh, whose main object was to give the precious birds the best chance, spread the risk by giving one pair to Monsieur Delacour at Clères and one pair to the Rotterdam Zoo.

The Rotterdam Zoo, was of course, very much honoured and we felt the more happy when, on 24th August, 1960, we were able to announce to Mr. Van den bergh the hatching of two *Afropavos*.

When we received this precious pair at the end of 1959, we housed them in an aviary in the *Victoria regia* hothouse, where the temperature fluctuates from 22°–27° C. and where the humidity is always very high. We planted the aviary in such a way as to more or less resemble a tropical forest.

At first the birds were very shy and always hid among the bushes, but after some weeks they grew tamer, and after some months they became very quiet and even accepted mealworms from the hand.

In April, 1960, they became more active and started displaying, both birds spreading their tails in the same way as Peacock Pheasants. The birds preferred to perch on the small trees which we had planted in their house. On the 10th May we found a crushed egg under a tree, and next day a broken egg. Then it dawned on us, that the hen would only lay in a tree-nest and that the eggs had fallen on the ground as there was no room for a proper nest. We therefore put a basket in their willow-tree, and this immediately received the attention of the hen.

On 1st June, 1960, there was an egg in the basket and the next day a second. The hen started brooding, lying very flat on the eggs, and remaining so still and silent that we often wondered if she was still

alive. On 16th June to our great disappointment we found the clutch broken on the ground ; this clutch proved to consist of three eggs, all containing embryos. We never discovered the cause of this calamity.

Fortunately on 22nd July, 1960, the hen started laying again and after she had laid a second egg on the following day, she very seldom left the nest. Later on, we found that the clutch contained three eggs.

On 22nd August the hen became a bit restless and maybe one of the eggs had already hatched on that day, but we dared not disturb her. On the morning of 23rd August we saw two chicks on the edge of the nest, one of which let itself fall down, the other remaining with the mother. The cock at once ran to the chick that had come down, and behaved completely like a hen, warming the chick under his breast and wings and showing the little creature how to look for food.

The next day, 24th August, the hen came down with the second chick and from that moment both parents cared for their offspring. We got the impression that the chick that left the nest first, preferred to stay with the cock, but that is only an impression. The third egg contained a dead chick.

The Afropavos did not feed their young with the bill like Peacock Pheasants, but we observed the chicks took the food from the bills of their parents.

The eggs of the Afropavo are somewhat large in proportion to the size of the hen and the chicks are very vigorous and can fly in two or three days. They prefer to spend the night up in the trees, under the covering feathers of their parents. Unfortunately one of the chicks died of coccidiosis on 9th September, but the other one has grown up to a very fine young hen, which has already become very jealous of its mother.

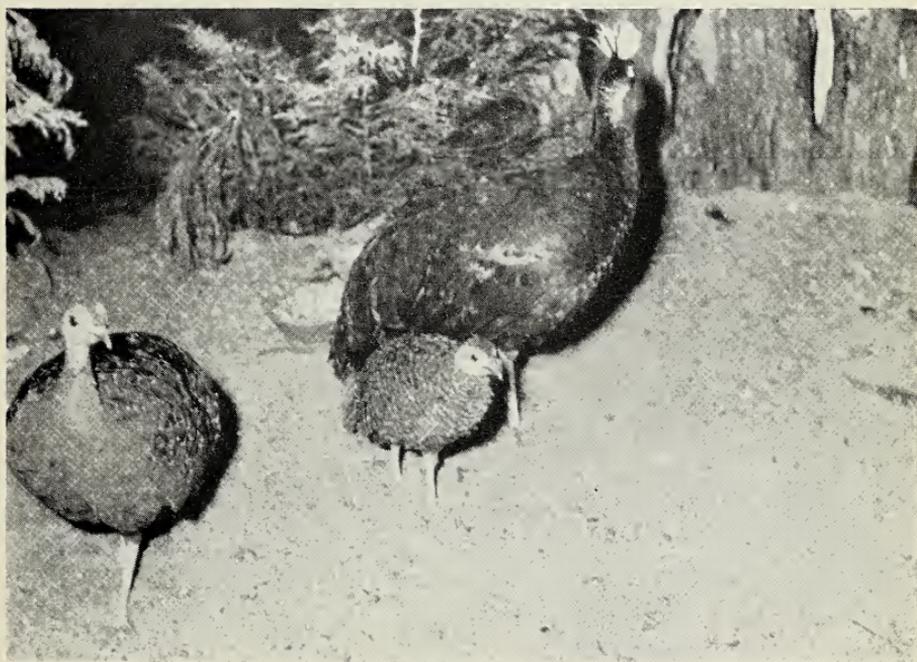
About 1940, Afropavo was bred in the Congo in the aviary of a private person. The result, however, was extremely poor, for the only chick which hatched died after a few days.

In June, 1960, the Antwerp Zoo again got some Afropavos from Mr. Cordier and the Zoo now possesses four pairs, two pairs are kept at Antwerp, and the other two pairs in the annex Plankendael at " Muizen ".

As, in our opinion, the breeding of Afropavo does not seem to be in any way more difficult than the breeding of many other gallinaceous birds, we hope that in the near future the species may be seen in many collections. In this event, the chances of preventing the extinction of these interesting birds will be increased.



CONGO PEACOCK FEMALE ON THREE EGGS

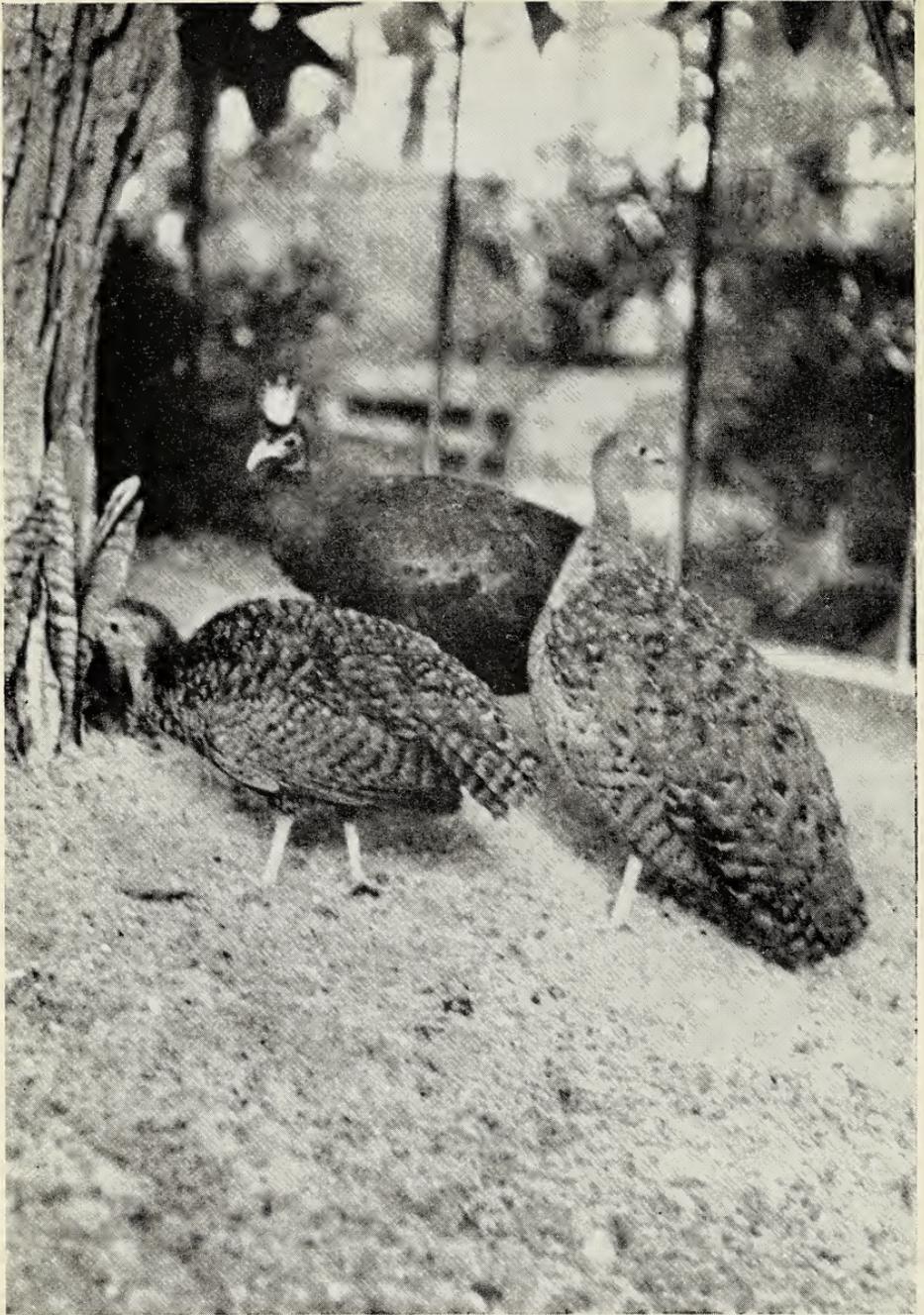


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CONGO PEACOCK MALE AND FEMALE AND CHICK THREE MONTHS OLD

To face p. 42



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CONGO PEACOCK MALE AND FEMALE AND FEMALE CHICK FIVE MONTHS OLD

To face p. 43

NESTING OF THE RED BIRD OF PARADISE

(*Uranornis ruber*)

By A. H. ISENBERG (Portola Valley, California, U.S.A.)

These birds come from the islands west of New Guinea. Six years ago I was fortunate in obtaining three of them. It seemed at the time that two were females, one being in first year plumage. The second year one of the "females" showed distinct horn growth, which only males have, and two years later produced his first-year plumes and the next year was fully plumed like the older male. This younger male was a most amusing bird, quite noisy and clownish, as he would dance by the hour, leaping back and forth on one branch and snapping at the branch's end until, after months of this behaviour, he had actually polished the last inch tip of the branch. Unfortunately this bird died of a head injury this spring (1960).

Up until last May neither male would tolerate the female so all three were in separate aviaries. The older male was without heated shelter and never the worse for weather all through winter with temperatures down to 28° F. several nights and heavy rains, etc.

In May I put the older male and female together in an aviary, approximately 40 feet by 20 feet and 10 feet high, planted with bamboo, fig, and two thick Japanese plum trees, and a good-sized lawn, plus the shelter (unheated) approximately 10 feet by 10 feet by 8 feet high.

The pair got along quite well here, and by 4th July the female had built a nest of dry leaves and twigs in one of the thick parts of a plum tree, about 8½ feet from the ground. The nest was boat-shaped rather than round and lined longitudinally with fine bamboo and grass stems. Two eggs were laid (beautiful eggs, pale fawn with, if anything, a pinkish wash and streaked with reddish brown). The eggs are much larger at one end. I managed to save one, the other disappeared.

The female alone sat steadily from 8th July to early August before I took the egg and found it infertile. John Griswold from the Philadelphia Zoo blew out the egg for me.

The male was already in moult when the female started laying, but the female only began moulting in September. The male now is, once again, in full feather and very beautiful. The male completely ignored the female and the nest.

A few days after I took the egg the nest was destroyed and the female carried a few sticks and leaves but then abandoned any further attempt. It is hoped that next year the nest will be built in May or June, while the male is still in full plumage.

I would appreciate any comments on the moulting and nesting of Paradise Birds. Dr. Sten Bergman had similar moulting-time sex differentials with his Kings.

My pair of Lesser Birds of Paradise are in the largest aviary, a veritable jungle of bamboo and other trees, but did nothing. This is their first season in this aviary. Perhaps next year? They, too, moulted like the Reds, the male first, by two months.

My little King Bird of Paradise completed his moult in August. Anyone knowing of a female King available, please do write me, as I have a perfect greenhouse breeding zone for them.

* * *

ON THE HARDINESS OF CAIQUES

By CLAUDE M. PAYNE (Barford, Warwickshire, England)

For a full and authoritative description of the species I would refer readers to the paper by Arthur A. Prestwich in the July/August, 1955, number of the *Magazine* and content myself with a report on one pair of White-bellied Caiques (*Pionites leucogaster leucogaster*). I would stress that I am not unaware of the fact that often it is the exception which proves the rule. However, it will not be amiss, I think, if I remind readers that Caiques, as a group, inhabit the lower reaches of the Amazon where the atmosphere is extremely humid and the temperature high—a most unhealthy climate for humans by any standard.

This particular pair of Caiques came to me through the good offices of a fellow member some five years ago. The first year, as they were in juvenile plumage, was spent indoors in a roomy standard type parrot cage, where they had a fairly good moult. During the following summer they were put out into an aviary in the garden. By a series of unexplained delays on my part the birds were allowed to remain in quarters which one would have thought very inadequate. However, as the birds appeared to be enjoying the fresh air and exercise (in point of fact they took a bath even when the temperature was below freezing point) I felt disinclined to remove them to the birdroom where, in the usual way, they would have spent the winter in a temperature of 50° Fahrenheit.

The Caiques undoubtedly flourished with this spartan treatment and took on a new bloom which has never left them. They only used the shelter, to which they had access through a nine-inch aperture, for feeding purposes and even in the most bitter weather they were ever ready to receive a titbit in the form of a peanut, grape, or mealworm. Although Caiques are noted for their strident voices, at these times they only uttered the harsh growl of pleasure.

During this particular winter we experienced every kind of weather from frost and snow to winter sunshine, but at no time was there the slightest sign of depression or ill-health. The birds often perched with

their feathers away from their bodies, but this is the normal way birds have of insulating themselves from the cold air. They also appeared to shiver, but they do this when excited. Any member who has kept Caiques will agree they are not the sleekest of birds and they always remind me of a tousled-haired urchin.

I am not one who subjects his pets to extremes of temperature merely to prove a point. I am too fond of comfort myself for that, but I do really think that we have tended in the past to fuss a little too much. I appreciate of course that one Swallow does not make a summer any more than one hardy pair of Caiques makes the genus as a whole hardy, but my experience with this particular pair would tend to show that they are hardier than was hitherto thought.

Since the summer of 1957 the Caiques have occupied an outdoor aviary and have never been brought into winter quarters. Their condition speaks for itself for seldom have I seen Caiques in such robust condition, with powers of flight far and away superior to that of birds which are only allowed out during the summer months.

The Caiques sleep in a small parrakeet nest-box about eighteen inches, by nine inches, by nine inches in the open flight. One last thought: although the Asiatic parrakeets here often lose their toes from frostbite the Caiques have complete appendages.

Mr. Arthur A. Prestwich, in the excellent paper already referred to, says on p. 164 "They (writing of the genus) are credited as being very sensitive to cold, but once acclimatized they seem reasonably hardy. They should, however, always be shut in their shelter at night and in the winter artificial heat must be provided".

Lady Poltimore, writing in the *Magazine*, November, 1936, about the successful breeding of a hybrid Black-headed Caique × White-breasted Caique says: "I put them in an aviary of which they were the only occupants. This aviary is heated by hot-water pipes, and has a garden flight which they use in warm weather, but they are always shut into the inside portion at night, and in the winter. I have found these birds very susceptible to cold, and during the time that they have been breeding this summer, we have often had to give them artificial heat."

Are my pair of Caiques an exception to the rule or is the species hardier than we have been led to believe? That is the question which still needs a lot of inquiry.

I have one other Caique at the moment, a Pallid Caique (*Pionites melanocephala pallida*) the survivor of four bought on the continent a few years ago. As this bird is a family pet he has not been subjected to life in an outdoor aviary. I believe he would prove equally hardy, but it would be extremely cruel to deprive him of continuous human company—he is never so happy as when he can nestle under one's chin and be fondled.

INSECTS AND FOOD MIXTURES FOR INSECTIVOROUS BIRDS

By ROBERT W. FICKEN and WILLIAM C. DILGER

(Laboratory of Ornithology, Cornell University, Ithaca, New York)

INTRODUCTION

Aviculturists have repeatedly stressed the desirability of feeding large quantities of a variety of live insects to insectivorous birds. The frustrations which we encountered in attempting to raise and keep perfect specimens of American Wood Warblers (Parulidae) for ethological studies led us to explore various techniques of insect culturing and capturing in an attempt to reach the ideal of an almost pure diet of insects. The best of these techniques from almost all standpoints is raising bee larvae (see Gary, Ficken, and Stein 1961). However, other methods are also valuable. The purpose of this paper is to discuss some of the methods currently used by entomologists in culturing and capturing insects and, where possible, to tell of our experiences in using these to feed insectivorous birds. There is also a short discussion of some important facts concerning avian nutrition including comments on food mixtures for insectivorous species.

INSECT CULTURE TECHNIQUES

Cultures can only be maintained if an adequate supply of adults is available. This may be easily accomplished by merely continually allowing a calculated number of the insects to reach maturity.

The following factors should be taken into consideration when choosing an insect species to culture for birds: (1) potential productivity and size of each species; (2) ease of culture manipulation and harvesting; (3) controllability of production; (4) danger of disease in the culture; (5) danger of the insects escaping into the home or laboratory; (6) cost of setting up the cultures and maintaining them; (7) efficacy of simply purchasing the insects from a commercial establishment rather than raising them; (8) danger of overfeeding any one species to the birds; and (9) palatability, digestibility, and nutritive value of the insects.

From all of the above standpoints House Crickets (*Acheta domestica*), Wax Moths (*Galleria mellonella*), House-flies (*Musca* spp.), Blow-flies (Calliphoridae), and Honey Bee larvae (*Apis mellifica*) seem most suitable and the culture methods of all except the latter are discussed in detail.

House Crickets (*Acheta domestica*) have been raised in large numbers by Dr. Robert L. Patton of the Department of Entomology, Cornell University, using a method modified slightly from the one used by

Dr. F. E. Whitehead (Univ. Arkansas). P. C. Stone (Peterson, 1953) claims that they provide good food for birds and other insectivorous animals.

A rearing container about 15 inches by 25 by 15 is a convenient size. A glass aquarium, a wood or metal box, or an enamelled cardboard box will serve the purpose. The bottom may be covered with dry sand, although this is not essential, but a finger bowl, cake pan, or similar container filled with wet sand should be provided as a repository for eggs. A single female may lay as many as 2,600 eggs and these should begin to hatch in thirty days at 80° F. or fifteen days at 85° F. The rearing and breeding cage should be kept in a warm room (80° F. to 85° F.) or provided with a heat source such as a bank of light bulbs. The large nymphs and adults are somewhat cannibalistic so hiding places should be provided for the small nymphs. Excelsior is the best material for this purpose. The young nymphs crawl into the material and the older ones use it as a resting place.

Open formula chick starter mash is the most economical food for crickets. This can be purchased from any poultry feed supply store. Avoid the formulations which contain antibiotics if possible. Water must be provided at all times. The easiest device for this consists of a half-pint jar or a six to eight ounce water tumbler filled with water, covered with a folded facial tissue, and finally covered with a round or square piece of heavy-duty aluminium foil. This should be crimped around the edges so that the tissue protrudes between the foil and the glass. This can be inverted in the cage and the crickets can get enough water to serve their needs by chewing the wet tissue. The tissue must be changed regularly since the crickets have a strong tendency to chew it off. Rearing can be done either in a series of separate containers for the nymphs or in a combined rearing-breeding chamber.

The easiest way to harvest the crickets is to use a scoop-shaped can made from a square gallon container. Cut one end at an angle to form a scoop and replace the other end with one-quarter inch hardware cloth. The crickets are gathered in the scoop and the individuals that are too small for feeding will fall or be shaken through the hardware cloth. The nymphs will reach the adult stage in from five to nine weeks depending upon the rearing temperature.

Black Field Crickets may be raised also using a method described by Swingle (1946) but these are much more chitinous than House Crickets.

Wax Moth larvae (*Galleria mellonella*) are an ideal species to culture for insectivorous birds. American Redstarts (*Setophaga ruticilla*) have been hand-raised and kept as adults using these insects almost exclusively (Dr. Millicent Ficken, pers. comm.).

Dr. David Pimentel (pers. comm.) has developed two excellent culture methods.

A medium is prepared as follows : Mix two pounds of " Pablum " mixed baby food, 600 cc. glycerol, 600 cc. honey, one quart non-fat milk, one quart brewer's yeast, and 1 per cent by weight of sodium or calcium propionate to inhibit mold.

The moths may be easily sexed by the length of their snouts (palpi) ; the male has a blunt snout while the female has a long one.

The moths may be raised in half-pint jars as follows : (1) fill the jars one-third full with medium ; (2) place two pairs of newly-hatched adult moths in each jar and cover the jar with a cardboard lid from an ice cream cup ; (3) place the jars in a plastic refrigerator box and include one open jar half full of water. This may be removed after the larvae have reached the second instar. When the larvae begin to pupate each jar is emptied into the bottom of a plastic refrigerator box or other similar container where they may be picked from the medium and fed to the birds or frozen for later use.

The larvae may also be raised in much larger containers such as ten-gallon tins in the following manner : (1) place 3 inches of medium in the bottom ; (2) add fifty pairs of adults and cover the container with a thin plastic sheet until the larvae reach the second instar ; (3) place a 3 or 4 inch strip of corrugated cardboard around the inside top edge of the container ; (4) when the larvae have begun to pupate by crawling into the corrugations of the cardboard, remove the strip and replace with a new one each day ; (5) add fresh medium as needed ; (6) harvest the larvae by merely peeling the outer coating off the cardboard. This technique should yield at least one hundred larvae per day during the emigration to pupate. The cycle may be continued indefinitely if the adult pairs are added each week.

Dr. Arthur A. Allen (pers. comm.) successfully raised Ruffed Grouse (*Bonasa umbellus*) on a diet that started with blow-fly larvae (Calliphoridae), using a method which he developed and which we have subsequently tried and found quite successful. A half of a beef lung is left outside until dozens of blow-flies have deposited their eggs. This lung is then placed in a shallow pan on a layer of charcoal to absorb moisture. After two or three days the larvae are shaken from the lung which is now dry and the lung is replaced by a slab of liver on which to fatten them. The pan itself is put in a larger milk pan containing a layer of bran so that the maggots, upon leaving the piece of liver, crawl out of the moist pan and drop into the dry one and cannot escape. After all the maggots have left the lung for at least twenty-four hours the bran is sifted through a strainer so that it falls through leaving the clean maggots and pupae. These are then ready for immediate use or they can be put into small plastic bags and frozen. The technique works well if several cautions are observed. The culture must be kept dry either by housing in an open shed or by building a shelter. The culture should be screened to keep out

predators such as dung beetles which feed upon the larvae. The amount of eggs laid should be carefully controlled so as to obtain the optimum number of larvae. When feeding the maggots to birds, care should be exercised. Some birds pass them whole through the digestive tract, for example, Eastern Bluebirds (*Sialia sialis*) (James Hartshorne, pers. comm.) and American Redstarts (*Setophaga ruticilla*). Uncleaned maggots, which have black undigested material in the gut, would obviously be dangerous to feed. Larger and tougher birds may do well on maggots. For example, a hybrid between an American Robin (*Turdus migratorius*) and a Blackbird (*Turdus merula*) was raised from the egg on a diet which consisted mainly of thawed blow-fly maggots and earthworms (Dilger, 1959).

Dr. David Pimentel (pers. comm.) has developed highly successful techniques for raising house-flies and blow-flies in quantity. Adult flies are kept in plastic refrigerator boxes (twelve inches by ten inches by four inches deep) which have been modified as follows: (1) a four inch by six inch hole is cut in the top and a one inch wide hole is cut along both of the 12 inch sides. These holes are covered with window screen; (2) a circular hole one inch in diameter is cut in the top and corked. In order to obtain eggs place several 50 cc. wide-mouth vials containing cheesecloth soaked in skim milk in with the adult flies. This may be easily done by grasping each vial with long forceps and lowering it through the one-inch hole. For blow-flies add a small piece of liver to each vial as well.

Prepare the medium for the larvae as follows: (1) heat 2.7 liters of water to boiling, then add 60 cc. agar powder and allow this to boil for 20 minutes; (2) in the meantime add 600 cc. dry skim milk and 600 cc. dry brewer's yeast powder to one liter of cold water. Mix this thoroughly with a beater; (3) add this mixture to the boiling agar solution after turning off the flame and stir until the mixture is uniform; (4) ladle this into 4-ounce ice cream cups or comparable containers until they are half full and store these in the refrigerator. One batch should yield 30 medium cups.

More of the same type of plastic refrigerator boxes are used for larval culture and are modified as follows: (1) a one inch layer of clean sand is placed on the bottom; (2) this in turn is covered by a platform made of hardware cloth which rests just above the sand; (3) a four inch by six inch hole is cut in the top and covered with window screen.

Place about 200 house-fly eggs in each medium cup and cover lightly or place about 100 to 150 blow-fly eggs in each medium cup and do not cover. Each culture box should hold about nine such medium cups.

When they are ready to pupate the fly larvae will crawl out of the medium cups and fall into the dry sand. The larvae or pupae (depending on how they are left) may be gathered daily by straining

the sand through a fine screen. Each plastic culture box should yield about fifteen grams during the emigration and pupation stage.

Two species, Fruit Flies (*Drosophila* spp.) and Mealworms (*Tenebrio* spp.) have been used by many aviculturists and their value in biological research has led to the development of very refined culture techniques (e.g., Galtsoff *et al.*, 1959, and Peterson, 1953). It should be mentioned, however, that *Drosophila* are undesirable for all except very small birds because of their tiny size which makes their culture inefficient. When feeding them to those small birds which have difficulty capturing flying insects, it is best to use a vestigial wing mutant or arrange the culture bottle with one tiny escape hole so that the birds may wait there for them to walk out. Mealworms are perhaps used more than any other insect by aviculturists but, as is well known, many birds should be fed them very sparingly. Galtsoff *et al.* (loc. cit.) and Peterson (loc. cit.) mention other insect species which also might be useful to culture for birds, but none of them seems to possess as many desirable qualities as those already considered.

Silk worm pupae, which are obtainable commercially, are a rather expensive food but have been used by several aviculturists (e.g., Astley, 1907, and Neunzig, 1939). In the U.S., *Promethea* silkworm pupae can be obtained commercially for about five cents each.

INSECT CAPTURE

Entomologists have developed many methods of capturing insects which can be fruitfully applied to aviculture.

Trapping is an excellent way of supplementing the insect diet of birds since it yields a wide variety and involves a minimum amount of work.

Night light traps of several types may be constructed to capture insects (see Peterson, 1953, for details). Such traps may be connected to a finely-screened cage so that the insects fall in and cannot escape. The use of an electric fan blowing downward from above the light increases the yield. The deleterious effects of light at night can be minimized by covering the top of the cage with opaque material and baffling the light at the opening or running a long, angled leader to the cage through which they would fall. Filtered ultraviolet light (black light) is very effective in bringing in insects but it is very dangerous to look into such a light.

Mercury vapor lights placed in front of a large white sheet attract many insects at night. These, of course, must be netted by hand and kept until morning.

During the day, insects can be attracted in large numbers to rotting fruit or meat hung in an outdoor flight and screened to prevent the birds from eating it.

“Sugaring” (using stale beer and brown sugar) often brings in many noctuid moths by night and a few butterflies and other insects by day. These may be captured by hand or the mixture may be brushed on the inside of an outdoor flight so that the birds can capture the insects (some moths will remain at the mixture until dawn while others may seek refuge in the vegetation in the cage).

Sweep nets are available commercially or may be constructed (see Peterson, 1953). These are best used in fields and by sweeping back and forth large numbers of insects may be captured and dumped into outdoor flights or into finely-screened indoor cages. The birds, of course, will pick out what they like.

Outbreaks of caterpillars can sometimes be discovered which makes practical the collecting of such species by hand. As is well known, hairy and spiny species are rejected by most birds.

If an ant mound is discovered, ant pupae can be collected easily using a method described by Bennett (1959). According to Naether (1955) live ant eggs (pupae) are in themselves a complete food.

Earthworms (*Lumbricus terrestris*) make excellent food for certain birds. These can be collected in huge quantities during the warmer months, particularly after rains. James Hartshorne (pers. comm.) has developed a very efficient technique by which he was able to collect as many as 500 of these worms in an hour. A dull, miner's lamp is worn on the head while a small bucket is hung around the neck. By crawling along slowly on hands and knees over the low-lying fairways of a golf course the number of worms captured on a good night should only be limited by one's speed, dexterity, and endurance. *However*, earthworms are extremely dangerous to use unless they are free of gapeworms, coccidia, and insecticide residues.

Lumbricus terrestris can be cultured using the methods developed for organic gardening (see Barrett, 1955) or biology (W. N. Ness in Galtsoff, *et al.*, 1959). The latter reference also contains a method of culturing the small white earthworm, *Enchytraeus albidus*, which he claims is an excellent food for small fish and amphibia.

Lumbricus terrestris may be kept alive several days by refrigerating them at about 40° F. We froze large numbers of them in little packets for use in the winter, the only drawback being that they become slightly mushy on thawing. Before freezing earthworms examine each individual to make sure it is alive.

“MEATING OFF”

When a bird is brought in from the wild, there is often a problem in getting it to eat dry mix if it is exclusively insectivorous. This process is termed “meating off” or “breaking off”. This may be attempted in several ways. Conway (1957) states: “The normal behavior of

some problem feeders may be utilized to change their habits. An example is certain warblers which will not feed readily when newly captured, but which will drink. The trick is to keep them warm and dry and gradually to add insectile food to their drinking water. In a little while the warbler is drinking a soup, then a mash, and finally eating our normal moist insectivorous mixture." He goes on to describe other methods used with woodpeckers and kingfishers. Another method is used more widely. The insect larvae are merely placed on the insectivorous mix and the birds inadvertently eat some of the mix in eating the insect. The number of insects put on the mix is slowly reduced as the birds learn to eat the mix. This process might be accelerated by putting a small dab of honey or nectar paste on each insect so that some of the mix adheres to it.

"Meating off" should be done with extreme caution. The birds should be watched carefully during the process to determine whether they are eating the mix. More sensitive species should not be pushed too fast, and may die if forced. One reason for this is that the change in diet is too abrupt and they cannot make a rapid enough physiological adjustment. Perhaps the best way is to give the birds a good meal of pure insects in the morning and evening and do the "meating off" in between. Some birds can never be trained to eat a dry mix. Generally speaking, even though softbills eat a mix, they should be given as many insects as possible throughout the year and particularly during the molting and breeding seasons.

AUTOMATIC FEEDING OF LIVE INSECTS

The problem of leaving birds which will eat only moving insects may be solved in several ways. Various baits (see above) will always attract some. A day's supply of wax moth larvae can be left in a dish of water where they will float and remain alive for at least eight hours. This method could also be tried with other insects. Cultures or live pupae may be left in containers from which the larvae or hatched adults can escape one at a time and be captured by the birds. Certain non-flying insects (e.g., crickets) can be left in straight-walled glazed dishes. The problem may be completely solved by releasing large numbers of any desirable insect species in a cage from which they cannot escape or crawl under things.

If the birds will eat insects which are not moving, they may be left with a large supply of pupae, or in cold weather with sluggish live adults and larvae. Frozen insects can also be used in this case but should not be left more than a day in warm weather or six hours in hot weather.

Another widely used method of obtaining insects for birds is simply cutting a hole in the cage to release the pair after the first egg (or all)

is laid and letting them forage in the wild (Ivor, 1943). However, it is best to give the birds an easy way of finding the hole again once they are out. By painting around the hole and by placing a perch so that it projects both in and out of the cage below the hole, the chances of the birds returning without difficulty may be greatly increased.

FOOD MIXTURES AND SOME NUTRITIONAL CONSIDERATIONS

It is quite possible to develop an inexpensive food mixture which is adequate for a single species. We have kept several species of thrushes in perfect condition on a mixture developed by Dilger (1959). However, this mixture was completely rejected by several parulids as well as Baltimore Orioles (*Icterus galbula*). It consists of one-third "Big Red" dog meal, one-third dried "flies" (actually aquatic bugs and other invertebrates), and one-third turkey starter mash. Starter mashes, in addition to turkey, have been developed for chicks, quail, pheasants, and ducks and any of these might be used in such a mix. The three components are mixed with cottonseed oil until slightly moist which greatly increases palatability as well as being an additional source of vitamins and fatty acids. The cottonseed oil should not remain in the food more than a few days. The reason for this is that the unsaturated fatty acids cause slow oxidation of vitamin E and to a lesser extent vitamin A. Cod liver oil is much worse in this respect (Scott and Norris, 1959, and Scott, pers. comm.). This oxidizing quality may be essentially eliminated by adding an antioxidant such as "Santoquin" which is used in chicken mash (0.01 per cent). Then, of course, the mix may be stored with the oil in it.

Self-choice experiments have been useful in helping to determine the relative number of various dietary components needed by chickens. Each bird is given a choice of a variety of foods and the amount of each eaten per day is measured. However, only by averaging the amount of each material taken by a large number of individuals was this method useful in formulating an adequate diet. Certain birds may take up to ten times more or ten times less than the average. These individuals were not healthy (Scott, pers. comm.). In self-choice diets for cage-birds similar experiments can be performed. These might include a wide variety of different seeds for finches or for insectivorous birds, a selection of several insect species or several commonly used wet or dry foods or an array of various insectivorous mixtures.

If mixes are kept in a cool, dry place the nutrients do not deteriorate and molding is rare. However, as soon as any excess moisture is added to a mix it will begin to decay and mold. If the mold happens to be *Aspergillum* spp, there is a great danger of the birds exposed to it

developing aspergillosus which is a deadly infection (Chute, 1959). *Aspergillum* will also grow well in wet, dirty cages. If a dry mix is developed and if it is not allowed to get any excess moisture in it, it may be left in a cage for several days. However, after this time a fresh supply should be given simply because it is actually a self-choice diet and the birds have, hopefully, picked out what is best for them. To maximize self-choice the mix should be fed in a flat, shallow container.

On the subject of vitamins the findings of nutritionists discussed by Scott and Norris (1959) will be considered. Ordinarily vitamin supplements are not necessary if the animal is fed a diet which has been scientifically determined to be perfect but, since these are available for so few birds, it is best to give birds some extra vitamins. We have supplied "Zymadrops" because they contain vitamin D₃ which is the most active form of vitamin D for the chicken. The recommended dosage has not been determined for many birds. However, since vitamins are expensive and since giving great overdoses may be harmful, it may be possible to arrive at a rule of thumb for dosage level based on their review of vitamins in poultry nutrition. This rule of thumb is based on some extremely crude assumptions: (1) All birds need about the same amount of vitamins as a young chicken; (2) all birds eat the same amount of mix per day in proportion to their body weight as a chicken; (3) the vitamin which is in least supply in "Zymadrops" relative to the needs of the chicken should be used as an index even though the relative amounts of the other vitamins given will then exceed that needed by the chicken; (4) the bird obtains no vitamins from its diet. Based on these assumptions 2 cc. of "Zymadrops" vitamins should be added to each pound of food mixture. If insects are fed and the bird is the size of a canary put two drops per day on an insect fed to it. We have found that it is very inefficient to add vitamins to the drinking water since it must be changed frequently and most of it is wasted. With birds that eat only seeds, however, this is the best method available. Seeds which have been soaked in vitamins retain these on their coats, but these are husked by many bird species and the vitamins are not ingested (Dr. Claude Bice, pers. comm.). Scott and Norris (1959) also point out an interesting fact about raw fish and the heart and spleen of warm-blooded animals. These contain thiaminase which destroys thiamin (vitamin B₁). Dr. Robert Goodwin (pers. comm.) found that Black Terns (*Chlidonias niger*) fed on raw fish developed symptoms of severe thiamin deficiency.

Norris and Scott (1959) bring out some other facts of general interest about dietary components. Dry powdered milk may be a useful addition to the diet in a low percentage but other carbohydrate sources should be supplied because at least some birds cannot digest

lactose. Torula yeast is very low in selenium and should not be used as a sole protein source. Scott (pers. comm.) considers brewer's yeast to be better for several reasons and this is not low in selenium. He also performed some interesting experiments with sterilized ground chicken feathers as a component (5 per cent) of pheasant mash. Ring-necked Pheasants in a crowded pen which were fed this mash did not pick while the controls did. The addition of ground feathers seems to fill some dietary needs of the pheasants and the addition of 5 per cent to insectivorous mixtures could possibly be useful.

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THE BREEDING OF THE RUFUS-BELLIED BABBLER (*Dumetia hyperythra*)

By Captain R. S. DE Q. QUINCEY (Hereford, England)

Shortly before Sqn.-Ldr. Everitt left to take up his appointment with Mr. Boehm in the United States, he told me that he had two pairs of small Babblers that he thought I might like to have. One of these pairs he informed me is called the Rufus or Red-fronted Babbler, a small, striated, olivaceous bird with a rufus frontlet, of which one or two further examples have arrived—and the other, unnamed pair have now been identified by Mr. John Yealland as the Rufus-bellied Babbler (*Dumetia hyperythra*). These little birds are darkish olivaceous brown above, and cinnamon rufus below, very slightly brighter on top of the head, and a distinctive feature is a somewhat fan-shaped tail, the central tail-feathers being the longer. They carry their tails straight out, and not upright like a Wren or Tailor-bird, and sometimes when hopping about they wag the tail from side to side. A photograph of one of the adult birds (I really can't tell which, but probably the cock) on a stone at the edge of the stream in their aviary was taken by David Attenborough last summer. It shows the general appearance of this little bird rather better than any description of mine could portray it.

The birds duly arrived and were wintered in an indoor aviary. They were always together, and I concluded they were a true pair, although to me they appeared to be identical. In the spring (1960) I turned them out into a very densely-planted aviary, where they had as companions a pair of Red-flanked Zosterops, a pair of Red-flanked Bush Robins, a pair of small Tanagers, and one Violet-eared Humming Bird. In the early summer they built a dome-shaped nest, laid, and hatched out two young ones, which died at about five days old and were thrown out of the nest. They appeared to be quiet for a little while, and then I discovered they had built three more nests, possibly to deceive inquisitive searchers! They were all dome-shaped, almost Wren-like nests. One was built about 4 inches above the ground in a tall tussock of grass, and the other two were in a small planting of *Lonicera nitida* about 2 or 3 feet above the ground. They laid in one of these nests, but apparently only one young was hatched on this occasion. However, this left the nest sometime early in July. At this time we were destroying wasps' nests, so plenty of wasp-grubs and live ant eggs (also plentiful just then) were available. Within three weeks of leaving the nest it was virtually impossible to tell the young one from its parents. At about this moment the hen built again and laid three eggs, which I should say are approximately the size of a Wren's egg, blotched and spotted more at the thick end



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RUFUS-BELLIED BABBLER
DUMETIA HYPERYTHRA

[David Attenborough

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with dullish red-brown markings on a greyish all-over ground colour, something like the markings on a Robin's egg, but the whole effect a somewhat more blue in tone. It is a little difficult to be certain of the period of incubation, but I would say it was about thirteen days. Two young ones were hatched, but these disappeared completely within two days—possibly mice—which I hope to exclude once and for all when these aviaries are rebuilt this or next year. I should think the young bird that was reared to maturity was in the nest about eighteen days, but these small birds are very secretive, and it is a little difficult to intrude too much on their privacy without upsetting things. When the hen went to nest again the cock bird continued to guard or keep near the youngster, when he was not taking his turn at incubating. This young bird is now completely independent, and seems to be in robust health despite an appallingly wet late summer. When I wrote and told Sqn. Ldr. Everitt of this breeding he was quite sure it was a "first."

Apart from Shamias, which seem to breed every year here, the only other birds that have done anything in 1960 are a pair of Golden Tanagers, which hatched two young, and which "something" removed from the nest when about eight days old. They were in a somewhat crowded aviary. The Brazilian Wood Nymph (*Thalurania glaucopis*) hen has tried to build twice, but has been so persecuted by the cock bird that, on both occasions, she seems to have given up hope. I hope she will not try again until next year. Rufus-bellied Niltavas built (in a nest-box), the hen laid three eggs, and was then picked up dead, although looking in perfect form. I put two of her eggs into a Spotted Flycatcher's nest, but this was destroyed by cats two or three days later. Red-flanked Bush Robins built (in a nest-box), but later the nest was destroyed, and we found one egg had a dead chick in it. Daurian Redstarts also built in a nest-box but the hen was found dead on her three eggs—all really rather unsatisfactory.

Loo Choo Robins nested in December, 1959. The hen was sitting on four eggs, in a nest-box in an outside flight, while snow was on the ground. She even spent Christmas Day on her nest! I took the cock away as he started moulting, and she gave up her nest after sitting for about four weeks! Then she went into a moult. When I put them together again in the spring she appeared quite friendly, and then suddenly hurled herself on the cock bird, whom she blinded or knocked about so much that he became blind, and had to be destroyed. She moulted again recently, and a new cock bird has also just come through his moult. I do not think I shall put them together before next spring, if they both survive the winter.

As described above, Captain R. S. de Q. Quincey has bred the Rufus-bellied Babbler (*Dumetia hypertyhra*). It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

NOTES ON MUTATIONS IN MASKED LOVEBIRDS

By D. L. MCKENZIE (Winchelsea, Sussex, England)

Mutations of the Masked Lovebird are still rare in this country. On the Continent, blues, yellows, and whites are fairly common but are generally of Japanese origin and are not particularly hardy. Blues that I have imported have not lasted many months and have not been really strong enough to risk outdoors. Yellows and whites are very poorly coloured, the yellow being heavily suffused with green and the whites with blue.

Two years ago I was fortunate enough to procure a British-bred blue hen and two green-blue cocks. Last year from one of these cocks and the blue hen I had five young—four blues and one green-blue. Early this year I was offered a yellow cock, one of an imported pair, the hen having died. As the cock was well acclimatized I purchased it and have mated it to the green-blue hen bred the previous year. From three rounds (the first farmed out to foster-parents) I have bred eight young—three yellows, three blues, and two greens (presumably split for yellow and possibly for blue and white as well). The young yellows are a better colour than their parent but still very variegated.

These British-bred mutations are equally as hardy as normal greens. The blues can be distinguished on hatching by the colour of the down, which is pink instead of the normal orange. The beak is orange in colour until several weeks after leaving the nest, when it changes to a pale pinkish-bone colour. The young yellows have the normal orange down on hatching and cannot be determined until they start to feather.

The flight feathers of the yellows are white, the remaining wing-feathers being heavily suffused with pale green. The body colour is mainly yellow, turning to green on the abdomen. The back is yellow from the nape of the neck, turning to green on the rump. The mask is brown instead of the normal black, and the beak is red.

The blue body-colour of these British-bred birds is much deeper than the rather pale colour of the Continental birds and two of my first-year cocks are really deep in colour.

I have constructed six new flights, 6 feet by 3 feet by 6 feet high

for more intensive breeding next season. These flights are half wire and half boarded. I find this an ideal compartment for one pair to breed in and leave them with their nest-boxes all winter. Lovebirds generally I find to be late breeders, first broods appearing in late June and early July, so that they are still rearing young in October. This suits them quite well with the usual mild autumns we have in the south and I am fortunate in that my aviaries are in a very sheltered garden and all face south.

Young birds definitely need more shelter and even their flights should be well protected. They need a good draughtproof shed into which they should be driven at night. They seem very susceptible to cold and wet in their first winter.

I feed mainly canary seed with a little Indian millet but they eat very little of the latter. Whole oats and striped sunflower I throw on to the floor of the earthed flights and I feed as much groundsel and chickweed as I can find. On this diet they keep particularly healthy, but in some nests the young are badly feathered and often leave the nest in a semi-naked condition, not completely feathering for a further week or two. This is obviously due to bad feeding by the parents and may be due also to their not being in perfect condition themselves. Feather-plucking, mainly at the back of the neck is another annoying fault with hens, but the young invariably feather perfectly shortly after leaving the nest.

I have had French moult in one nest this year but fortunately not amongst the blues. This is not uncommon, I believe, with lovebirds and the young are best destroyed.

Next season I intend to limit my breeding activities to the Masked mutations, keeping only the best breeding pairs from my other birds as foster-parents.

Although a clutch is usually five eggs, they seldom rear more than three, and two is more normal. It is a pity to waste these other eggs and there is no difficulty in fostering out to other breeding pairs soon after hatching, leaving each pair with two young to rear. If all the first-round eggs are removed soon after the clutch is laid they quickly go to nest again. The first eggs can be farmed out to normal birds already sitting and an extra round is thereby obtained without the mutation pair being unduly taxed.

The big problem now is the introduction of fresh blood. With very few blues in the country and the Continental birds being so unreliable this is not going to be easy.

Mr. E. N. T. Vane is of the opinion that Continental mutations of Japanese origin are of mixed Masked and Black-cheeked Lovebird stock. The brown mask of my yellows might indicate this. I have noticed that all young green birds bred from the original yellow cock show a reddish brown tinge to the mask especially on the forehead

on moulting into adult plumage. The masks of the young blues from this bird are quite normal.

I now have a stock of eight blues, five green-blues, and three yellows. Some of these will have to be paired to normals in order not to inbreed too closely.

* * *

"A SELF-REARED MANDARIN"

By VISCOUNT CHILSTON (Maidstone, Kent, England)

It may seem paradoxical that in a year of much arduous but successful rearing the one breeding result which has given me more pleasure than any other was the one which was achieved without my aid at all—in fact even without the aid of the infant's own kind. The latter fact was what seemed to me to be of interest and perhaps to help to explain the comparative ease with which feral colonies of Mandarin Duck have from time to time become established in this country.

I had kept a couple of pairs of Mandarin for several years without their having ever—to my knowledge—bred. This year (1960) seemed no exception, until one day at the very beginning of May—during an exceptionally cold and wet spell of weather—I saw, darting nimbly over the surface of my lake—what I instantly recognized to be a baby Mandarin. I have bred many Carolinas, and they were breeding this year, but there was no mistaking the yellower colour, the large eye with its pronounced streak, the longer legs, and the more "aristocratic" head and bearing—in fact the altogether more intelligent and self-sufficient air which distinguishes the Mandarin from "lesser breeds".

For, though it is evident that a Mandarin egg must have been laid in one of the several Carolina nest-boxes placed on the island in the lake, the duckling's connection with the pair of Carolinas, who in the first few days appeared to feel some responsibility for it, was of the loosest possible description. Unlike most other ducklings, it seemed neither to need nor to wish for their protection. Indeed, so independent was this little creature that within a few days of hatching it was coming up on to the land with the other waterfowl at feeding time and—to my horror—eagerly picking up and swallowing hard corn. It knew no fear—either towards myself or the other birds—despite the fact that it was continually being pounced upon by a vicious Magellan Goose, who once even caught it and threw it about a yard into the air.

Partly through its own indefatigability at catching flies on the water and partly through the aid of poultry pellets (which I tried to put in its way rather than corn), it grew rapidly and strongly. Every feeding time, if it was not already there waiting nonchalantly among

the adult ducks and geese, there was a moment's apprehension—and then suddenly it would appear as from nowhere, sleek and spry as ever. I never made any attempt to lay hands on this charming little creature for fear of destroying its confidence ; so it was never pinioned, and though, when it began to fledge I debated whether to feather-clip it, I never did so, deciding to hope it would stay of its own accord. Instead, as soon as its sex (a male) was clear, I got it a young mate to try to tie it by invisible bonds.

However, though now a magnificent specimen in full nuptial plumage, he pays no attention whatever to this one or to either of the other females of his own species, but prefers to consort with some Carolinas kept on a stream in another part of the grounds, whither he flies daily—swift, silent, and agile as a Woodcock, as he flits through the trees—after feeding with the other birds beside the large lake. Only in this choice of company is the influence of his foster-parentage perhaps discernible.

* * *

NOTES FROM THE WILDFOWL TRUST

By S. T. JOHNSTONE (Slimbridge, Gloucestershire, England)

We have, since 1957, received great co-operation from the New Zealand Government in our effort to acquire a comprehensive collection of waterfowl that are indigenous to the Dominion. In that year four species were caught and sent by polar air route to us at Slimbridge. These were the New Zealand Grey Duck (*Anas superciliosa superciliosa*), New Zealand Scaup (*Aythya novae-seelandiae*), New Zealand Brown Duck (*Anas aucklandica chlorotis*), and Blue or Mountain Duck (*Hymenolaimus malacorrhynchos*).

Early in 1960 we heard that the Department of Internal Affairs had hatched and reared some Shoveler and in June two pairs of these interesting birds duly arrived. They settled down well after the rigours of quarantine and it is hoped that in due course they will breed. A further two male specimens of the exciting Blue or Mountain Duck also arrived and it is hoped to dispatch us some females of the species in the coming year.

Having regard to the generosity and trouble taken by the New Zealand authorities on our behalf, we are pleased to report that three of these ducks have now been bred here : the Grey Duck, the Scaup, and now in 1960 the Brown Duck. Two pairs of Brown Duck that came in 1957 have never become very tame and spend a great deal of the daylight hours hiding in the grass and rushes of their enclosure. One pair shared a pen with a pair of Cereopsis Geese but neither showed any interest in the other. Nesting sites were provided in the shape of boxes at ground level, cover fabricated from willow wands, and cider

barrels raised some two feet from the ground. All these were used a great deal as refuges from the public gaze and it was this habit that accounted for the failure to find the nest before the duck commenced incubation. It was thought that the missing duck was merely hiding in the cider barrel but she moved and was seen to be covering some eggs. It was decided to leave her to her own devices and she was undisturbed for three weeks. On going to the barrel after this interval four large creamish-buff eggs were found deserted, two of which were addled and two infertile. These averaged 52 g. in weight and measured 57 mm. by 42 mm. A point of interest was that there were no broken shells in the nest and a complete absence of down. Although the *Dendrocygna* pull no down and the swans very little one would not have expected this to be characteristic of *Anas aucklandica chlorotis*. During this investigation both birds were invisible in the undergrowth and we assumed that we would have to wait for another year for successful breeding. Two days later, to our immense pleasure and surprise, the duck appeared on her pond with three dark brown ducklings. Both parents and babies were caught up and put into the Guinness Aviary in order to keep them free from the attentions of the *Cercopsis* and vermin. The food offered consisted of ants' eggs, biscuit, and turkey starter crumbs ; a small amount of the last disappeared overnight but from the state of the turf in the aviary it was apparent that a great deal of nocturnal worming was taking place.

Examination of a duckling showed there to be little contrasting downy pattern and save for four light spots on the back and a small area of the belly, the overall appearance is of dark mahogany. The bill is large and slate-blue in colour and the tarsus is grey. It is suggested that the ducklings should resemble those of the Chestnut-breasted Teal, but my impression is that they are quite different from any other ducklings we have reared at Slimbridge. Hatched about the 17th September the young appeared to be fully grown by the middle of November.

Apart from the Brown Ducks, some 1,200 birds of ninety different kinds were reared in our collections but we had our disappointments. The Trumpeter Swans laid five eggs, three of which were fertile, but the pen failed to bring off any cygnets. The only Pink-footed Goose to lay hybridized with a Greater Snow Goose. Three Hooded Merganser ducklings hatched but failed to survive more than three days. The use of some straw in the nesting-boxes that proved to have a heavy infection of *Aspergillus fumigatus* accounted for the deaths of Ross and Emperor goslings, a whole brood of Barrow's Goldeneye, and five young Smew.

On the credit side the Magpie Geese reared four young, the Bewick's Swan four, and the Black-necked Swan five cygnets. In the aviary the Spotted Whistling Duck hatched and reared twelve young, the



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NEW ZEALAND BROWN DUCK FAMILY AT SLIMBRIDGE, OCTOBER, 1960

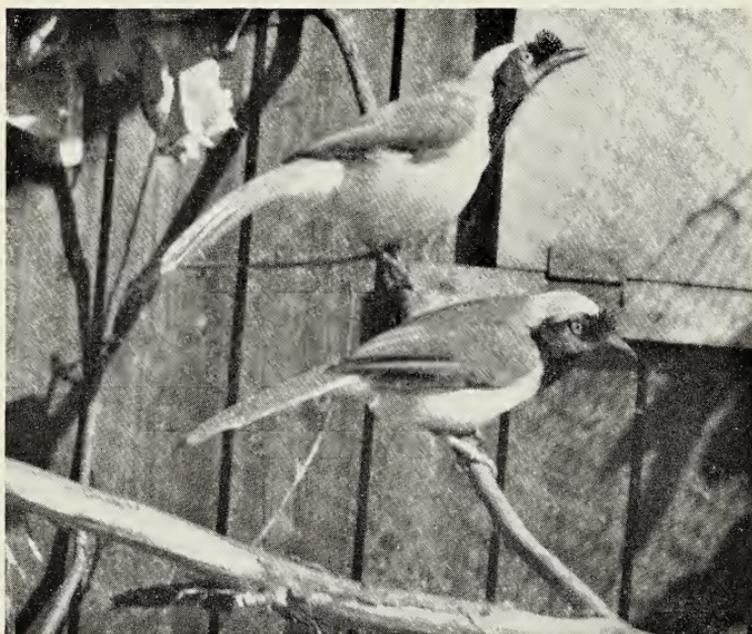
[Phitippa Scott



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[Photo: Alec Brooksbank

BLACK-CROWNED WAXBILLS (*Estrilda nonnula*)



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[Photo: Alec Brooksbank

PERUVIAN GREEN JAYS (*Xanthura yncas*)

Female below, and male above, starting to display

To face p. 63

Laysan Teal reared three, the Hartlaub's Duck three, and the Cape Shoveler three.

Among other interesting species the following were hand-reared : Southern Red-billed Whistling Duck (*Dendrocygna autumnalis discolor*), Black Brant (*Branta bernicla orientalis*), Argentine Red Shoveler (*Anas platalea*), New Zealand Scaup (*Aythya novae-seelandiae*), Australian White-eye (*Aythya australis australis*), Barrow's Goldeneye (*Bucephala islandica*), Common Goldeneye (*Bucephala clangula clangula*), and Smew (*Mergus albellus*). There were over fifty Marbled Teal and over thirty Ringed Teal. The Ne-ne flock now numbers over one hundred birds, twenty birds being bred this year at Slimbridge, five at Peakirk, and four at Leckford.

* * *

BREEDING RESULTS AT THE KESTON FOREIGN BIRD FARM DURING 1960

By EDWARD J. BOOSEY (Keston, Kent, England)

With a few exceptions such as Western Bluebirds, African Grey Parrots, and blue Ringnecks, the 1960 breeding season here at Keston was one of the most disappointing we have ever had. This may have been partly due to the abnormal weather which, although it was so sunny in May and early June that it seemed we might be going to have a repetition of the lovely summer of 1959, was thereafter literally a complete washout, with frequent thunderstorms, torrential rain, and no spells of settled weather at all.

The following parrakeets were bred : blue Ringnecks, lutino Ringnecks, Layard's, Golden-mantled Rosellas, Stanleys, yellow Red-rumps, Splendid Grass Parrakeets, Turquoisines, and Bourkes. Also Cockatiel, Fischer's, Masked, and Peach-faced Lovebirds, and many thousands of Budgerigars in all the various colour varieties.

Others, which hatched young but failed to rear them were : Pileated Parrakeet, Princess of Wales's, Plum-headed, and our male lutino Plum-headed mated to a normal-coloured hen.

A pair of African Grey Parrots reared three fine young ones, and a pair of Blue-fronted Amazons two ; while a pair of Cuban Amazons and a male Festive mated to a female Red-throated Amazon (both of which pairs had bred successfully in previous years) hatched young which died in the nest when about half-grown. A pair of Red-sided Eclectus again had clear eggs.

Mountain Bluebirds and Amethyst Starlings went to nest but failed to rear any young, but Western Bluebirds did very well, one pair rearing seven young and another pair six. There were, however, several losses after the young were fledged which may have been caused either through injury to the skull or from vertigo—the symptoms of

both being much the same. All the young ones were excellent specimens, but were terribly wild, battering about if anyone went near their aviaries. Next year (1961) we are going to have the top of the flights entirely boarded over, as most of the damage is, of course, done when they bang their heads against the wire roof of the flight. A cock Mountain Bluebird mated to a hen Western reared one young one—a female.

A pair of Australian Crimson Finches went to nest with all the zeal of Zebra Finches, rearing one in their first nest and two in their second. By then it was late in the year and their nest-box was removed, but they continued to carry nesting material until well into the winter.

In 1959 we received among a consignment of Common African Fire-Finches a male which was rusty-orange in colour instead of red, and a female which was equally distinct, the beak in both cases being orange instead of red. The pair spent the winter in an aviary to themselves and went to nest in the spring rearing two in their first brood and four in the second, all of which take after their parents in colour. On their arrival we sent a description of them to Mr. Macdonald of the British Museum and he replied that he did not know of them at all and that they had no similar skins at the Museum. He thought they were probably a colour mutation, but that as we had received a pair and not, as is much more usual, just a single specimen, there might be a small colony of these unusually coloured Fire-Finches established and breeding apart from the others.

That this may be so, or that they may even be a hitherto unrecorded local race, has been rather interestingly borne out by the behaviour of ours. All six young ones, which have turned out to be five cocks and one hen, are in an aviary together with two normal-coloured hens. Yet, although all the orange cocks are interested in the orange hen, they ignore the two normal hens completely. In any case I mentioned in a letter to Mr. Macdonald that as the place where a new colour variety of a bird was first propagated is so soon forgotten, it might be desirable to incorporate Keston in their name, and he replied that he thought they might suitably be called the Keston Fire-Finch; so, adding a word to denote their colour, we propose to call them the Keston Orange Fire-Finch.

Two hen orange Roller Canaries mated to a cock Hooded Siskin went to nest and hatched young which were thrown out of the nest soon after they hatched, and as we felt that the Siskin was in some way responsible for this, we removed him when they had gone to nest again. One hen, however, got egg-bound and the eggs she had already laid were put with the three the other hen had just started to incubate, and she eventually hatched two young ones which she reared single-handed. When first fledged they were little brown Linnet-like birds with no trace of red or orange, but by now (December) they take very

much after their father in appearance, except that their body colour is orangey-copper instead of the flame-red of a Hooded Siskin. Rather unusual is that, whereas most hybrids are about intermediate in size between their two parents, these two are much the same size as a Roller Canary, which, of course, is a considerably larger bird than a Hooded Siskin.

A supposed pair of Azure-winged Magpies (*Cyanopica cooki*) nested in a privet bush in our large pond aviary, but shortly after incubation had started, the smaller of the two was found scalped, and as all the eggs were clear the birds were probably both hens, the larger of which had turned upon and killed its companion.

The breeding here this season for the first time in captivity of the Pretty Warbling Finch (*Poospiza ornata*) has already been fully recorded in the *Magazine* by Mr. Cummings, and a pair of Ringed Warbling Finches (*Poospiza torquata*) also went to nest, but failed to rear any young, probably because their nest was built close to the ground, and while sitting they were disturbed by mice.

In the spring we received several pairs each of two rarely-imported Waxbills, namely the Black-bellied Fire-Finch (*Lagonosticta rara*), and the Black-crowned Waxbill (*Estrilda nonnula*). The Black-bellied Fire-Finch is very handsome, being a rich claret-colour with the breast and abdomen black; while the Black-crowned is to my mind one of the prettiest of the Waxbills, having a sooty black cap and tail and dark slate-grey back and wings. The under parts are chalky-white faintly tinged with grey, and a narrow line along the side of the body, just below the wings, is bright crimson, as are the rump and flanks. The upper mandible is red and the lower one blackish. We have retained two pairs of each species and hope to have a shot at breeding them next season. Last year's liberty pair of Australian Crested Bronze-winged Pigeons wintered successfully in the garden and went to nest in the same tree rearing four young ones in two broods. The hen, however, was not seen again after the second two fledged, so must either have died or been killed, as it is most unlikely that she would have strayed.

We tried Barbary Doves at liberty and possibly because they had been kept in an aviary instead of a cage before being let loose, they quite belied their reputation of being "stupid birds at liberty", as they flew quite strongly and roosted in sensible places well protected from owls. They are difficult birds to sex but I think we had three cocks and a hen, and the latter went to nest, but disappeared while sitting. Nevertheless, we caught up the remaining three in the autumn and having since obtained three more shall hope to let out six next year. They are tame and charming and their pale colouring makes them very conspicuous and decorative at liberty—added to which, of course, is the delightfully soothing sound of their coo—the nicest perhaps of that of all doves.

The wild Turtle Doves, which normally are so nervous as to be quite unapproachable, gained confidence through coming to feed with our Barbary Doves and Crested Pigeons, and it was a rare pleasure to be able to get close enough to them to appreciate what truly beautiful little doves they are.

A particularly sad loss was that of three specimens of the rare and beautiful Jardine's Parrot. We started the season with two pairs of these birds which we had had for over a year, so there seemed every hope of breeding from them. Then one night a thief gained access to our terrace aviaries, and finding the doors of the flights padlocked, contented himself with opening many of the shelter feeding doors. Actually few birds escaped, but among them had to be the best pair of Jardine's Parrots, and as the hen of the other pair died suddenly about a week later, we decided to part with the remaining cock, as there seemed little hope of being able to obtain a mate for him.

The hen of our pair of Peruvian Green Jays (*Xanthura yncas*) died towards the end of the summer, but the accompanying photograph of them was taken by Alec Brooksbank the previous year. When first received from an aviculturist in Cornwall, their plumage had already undergone the same colour change in captivity as takes place in the case of the Hunting Cissa—that is to say the green areas had gone blue and the yellow ones white. It may, therefore, be of interest to record that by the end of the two years we had them at Keston, the blue of the upper surface had become suffused with green, and the white of the under parts with yellow. This may have been due to a combination of three factors: they were the sole occupants of a roomy planted outdoor aviary where in summer they were able to capture for themselves a considerable quantity of live insects, etc; their home-made insectivorous mixture contained soya flour and raw grated carrot; and during the moult they were kept constantly supplied with elderberries—the elder being one of the comparatively few things that really revel in our very chalky soil, which is so deadly to many of my own favourites, such as rhododendrons and azaleas.

Another loss was that of our best pair of lutino Ringnecks—plus their three young ones. The latter were dead in the nest by the time their mother's body was discovered, and just to round things off, the cock also died a few weeks later.

A further casualty was the last of our Brown's Parrakeets—a rather elderly male who at one time nearly murdered his Brown's wife, but had produced a brood of hybrids when mated to a hen Golden-mantled Rosella.

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BREEDING OF THE SMOOTH-BILLED ANI

(Crotophaga ani)

By A. H. ISENBURG (Portola Valley, California, U.S.A.)

Four years ago I received, from Holland, five Smooth-billed Anis ; it was the first time I had ever seen these birds offered. All arrived in good shape but rather thin. After three weeks in a holding aviary they were fit to release into one of our largest aviaries, approximately 50 by 40 feet and 9 to 15 feet high, plus a large unheated shelter.

In 1958, a nest was built in the shelter among dry branches on top of a "holding aviary". The young hatched but none was reared. In 1959, several young hatched but only one was raised by hand and is now a most affectionate, tame bird. It is not tolerated by the others, so is kept in one of the "holding aviaries", where it is menacingly visited by the adult Anis.

This year (1960) the Anis had killed one of the original five and then nested about 10 feet off the ground in an alder tree, which is quite dense from many prunings. The nest is quite large and made of leaves, twigs, and grass. The eggs were greenish-blue with a chalky white coating. All four adults seemed to incubate and guard the nest and, when the young hatched, all four helped in feeding.

This year when the young left the nest I did not take them, as the weather was quite warm for all of July. One young was reared from the first nest and one was thrown out. We tried to rear this one by hand, but after several weeks, it succumbed. The other matured well. Four young were raised from the second nest in July and, again we had fine weather. After the five young were well on their way, the adults killed two of the four adults before we could separate them. This action was rather baffling as Anis are so gregarious in the wild. I did notice that one of the four adults did not keep up with its duties of feeding the young, but the others did.

It was most amusing to toss a mealworm into the air and watch these grotesque and rather clumsy-billed birds very adroitly catch the worms and rush off to feed the young. They never carried more than one mealworm at a time, so it can be imagined how many trips the parents made to feed their raucous young. The mealworms were always carried by the head and disappeared down the young like lightning. Pieces of horse-heart and much ground meat was fed. The ground meat I sometimes mixed with yellow corn-meal, wheat-germ, and pablum. Anis catch a lot of small insects on the lawn. These birds are very quick in their actions.

The flock of seven Anis is fun to watch, trying to outdo each other when mealworm time arrives. Anis are great sun worshippers and continuously stretch out in the sun. I have watched Groove-bills in

Mexico and Smooth-bills in the Caribbean Isles and it seems they are always stretched out in the sun atop of bushes. They are most amusing birds, even though so sooty-black, but their plumage does have a shine and the feathers along the back are "shelled" quite nicely. One can't help but think of prehistoric animals when looking at Anis.

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LONDON ZOO NOTES

By J. J. YEALLAND

Arrivals of especial interest during the months of January and February number twenty-five. A second Christmas Island Frigate Bird (*Fregata andrewsi*) was brought from the Cocos Islands by Capt. D. Scorgie: it appears to be a season older than the first and of the opposite sex—evidently a female, for it is larger.

Other presentations include a Fulvous Whistling Duck sent from Uganda by Mrs. E. Wright, a Whooper Swan from Mr. Tom Spence, two Hawaiian Geese from the Wildfowl Trust, a Baikal Teal from Dr. K. C. Searle, two Nutmeg Fruit Pigeons, two Green Imperial Pigeons and a White-fronted Bronze-wing (*Henicophaps albifrons*) from Mr. A. A. Prestwich, a Chestnut-bellied Nuthatch from Messrs. G. H. and J. R. Newmark and a Military Starling (*Pezites m. militaris*) from Mrs. A. Fowler.

Two Oyster-catchers and four Dunlins, a Malachite and a Wedge-tailed Sunbird, a pair of Fairy Bluebirds (*Irena puella turcosa*) and two Rothschild's Grackles (*Leucopsar rothschildi*) have also been received.

The Hawaiian Goose was first exhibited in Regent's Park in 1832 and bred here in subsequent years. This bird bred freely in European collections, but for some reason became scarce soon after about 1900 and the last specimen, a gander forty-two years old, vanished from Clères at the time of the invasion in 1940. From three specimens received by the Wildfowl Trust in 1950-51, more than 100 have been bred at Slimbridge and at Leckford—almost half the world's total population and the classic example of how aviculture can, in certain cases, assist in the preservation of birds.

* * *

COUNCIL MEETING

A Council Meeting was held on 8th March, 1961, at the Rotary House Club, 21 Portman Square, London, W. 1.

* * *

THE SOCIETY'S MEDAL

The Society's Medal has been awarded to :—

Mrs. K. M. Scamell, for breeding the Daurian Redstart, *Phoenicurus aureora aureora*.

* * *

CERTIFICATE OF MERIT

The Society's Certificate of Merit has been awarded to :—

The Dudley Zoological Society, Ltd., for breeding Steller's Jay, *Cyanocitta stelleri*.

ARTHUR A. PRESTWICH,

Hon. Secretary.

BRITISH AVICULTURISTS' CLUB

The seventy-third meeting of the Club was held at the Rotary House Club, 21 Portman Square, London, W. 1, on Wednesday, 8th March, 1961, following a Dinner at 7 p.m.

Chairman : Mr. K. A. Norris.

Members of the Club : P. S. Bates, A. W. Bolton, Miss Kay Bonner, W. Brain, the Rev. A. Campbell, B. Dittrich, M. D. England, Miss R. Ezra, Colonel H. B. Finch, Mrs. O. L. Gent, Dr. E. F. Gleadow, Mrs. R. Goodman, Dr. R. Gottlieb, H. J. Harman, L. W. Hill, Miss R. Hill, Dr. E. Hindle, Miss S. I. Hobday, F. E. B. Johnson, Mrs. P. Johnstone, Dr. S. B. Kendall, R. G. Kirkham, Miss E. M. Knobel, Dr. F. B. Lake, A. J. Lambert, Captain J. Lee-Hudson, R. H. Mantri, R. F. Marshall, G. S. Mottershead, S. Murray, Sir Crawford McCullagh, Bart., W. R. Partridge, C. M. Payne, A. A. Prestwich, J. H. Reay, D. H. S. Risdon, R. C. J. Sawyer, H. A. Snazle, T. Spence, E. O. Squire, Newton R. Steel, P. Sutton, E. A. Tickle, P. L. Wayre, Mrs. G. Wheatley, Mrs. M. Williams, F. J. Wiltshire, J. J. Yealland.

Members of the Club, 49 ; guests, 23 ; total, 72.

R. G. Kirkham introduced the colour film *Not Ours to Destroy* which he and Terence Murphy, Director, Dublin Zoo, had made in Africa. The film starts with the party leaving the hotel at Entebbe by Land-rover. The journey took them to the Congo National Park at Ruwinda, from there into the Ituri Forest to see the pygmies, and then up to

the Murchison Falls and the Queen Elizabeth Park in Uganda ; from thence back to Nakuru in Kenya to film the flamingos. The second part of the safari took them from Nakuru to the N'gorongoro Crater, Amboseli, Tsavo National Park, and finally back to the Nairobi Reserve. In the Congo they filmed elephant, buffalo, and hippo, and in the Queen Elizabeth Park, on the way to Murchison Falls, crocodiles and birds ; at Lake Nakuru, flamingos, and at the Crater, lions, rhino, zebra, gnu, ostriches, and the various buck ; and at Amboseli, giraffe and a few more birds.

The photography was excellent, a feature being that considerable care had been taken to show the natural habitat of the various mammals and birds. The commentary, by Murphy, was concise but informative. The writer has only one criticism of this otherwise splendid production. The almost continuous, at times distracting, background music bore no relationship to the pictures—it was quite unnecessary and it would perhaps have been better had it not been added to the soundtrack.

To Kirkham is due the thanks of all members and guests for providing such an enjoyable evening's entertainment.

ARTHUR A. PRESTWICH,
Hon. Secretary.

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NEWS AND VIEWS

Peter Scott has been elected Rector of Aberdeen University.

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The Avicultural Society of South Australia has changed the title of its monthly journal from *South Australian Avicultural Society Magazine* to *Bird Keeping in Australia*, commencing with the January, 1961, number.

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The U.S. Department of the Interior reports a count of thirty-six Whooping Cranes in the vicinity of the Aransas Wild Life Refuge, on the Gulf coast of Texas. This is the largest number recorded since the first count in 1938.

* * *

In the *Giornale degli Uccelli*, November, 1960, and *Ornithophilie*, November–December, 1960, there are accounts by Orazio Farina, Bagnara di Romagna, of his success in rearing two (of three hatched) Jendaya or Yellow-headed (*Aratinga jandaya*) × Nanday or Black-headed (*Nandayus nenday*) Conure hybrids. This event is of particular interest on account of its being an inter-generic cross.

* * *

Forty-three species, varieties, and hybrids were successfully bred in the Adelaide Zoological Gardens during the 1959–1960 season.

Director V. D. Haggard is especially pleased with the rearing of two Mute Swans, two Green Peafowl and one Australian Stone Curlew (*Burhinus magnirostris*)—the last is a species which has become somewhat rare due to the depredations of the fox.

* * *

Breeding results, 1960. R. T. Kyme, three Golden-mantled Rosellas, nine Cockatiels, five Bengalese : Mealy Rosellas and Stanleys had fertile eggs and Pennants young ten days old, all lost through cat trouble. J. Moir, nine Cockatiels, eight Peach-faced Lovebirds, three Long-tailed, five Bicheno's and two Ribbon Finches. Derek Young, two Pennants, four Splendids, fourteen Turquoisines (all from newly-imported birds), and one blue Masked Lovebird.

* * *

At long last there appears to be a possibility of some relaxation in the Government of New Zealand policy concerning the importation and keeping of foreign birds. This has encouraged a few enthusiasts to re-form the Avicultural Society of New Zealand which has been in recess since the last war. The membership at present numbers about sixty, under the Presidency of G. Rowland Hutchinson whose name is synonymous with A. S. of N.Z.

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Dr. Edmond A. Schlesselman, Fresno, California, reports his breeding results, 1960 : Eastern Rosella, five ; Yellow Rosella, four (" these are the second to fifth ever in the U.S.A. I raised the first last year ") ; Pennants, five ; Indian Ring-necked, one lutino and three splits ; Plum-headed, one ; Moustached, five ; Barrabands, three ; Red-rumped, five ; Bourkes, ten. " I have the only ' breeding ' pair of Scarlet-chested in the U.S.A., but so far no success—eggs, but nothing else. There are two other Scarlets but the hen has never laid and egg."

* * *

Lloyd B. Thompson, British Columbia, writes of 1960 : " We had a very good year and reared six Prince Lucien's Conures, ten Ring-necks including two lutinos, two Plumheads, six Redrumps, five Bourkes, five Turquoisines. My cinnamon Lineolated had two young but she died a few days ago. A number of Lovebirds, including one pied Peachface, and eleven Diamond Doves were reared.

The liberty finches were a constant source of pleasure. While we lost a number of single pairs that were liberated we did catch up more Cordon-bleus and Fire-Finches than were let out."

* * *

Charles Everitt sends a note concerning the breeding of the Pretty Warbling Finch (1960, 171) : " If the hen Mr. Cummings refers to is the one he had from me just prior to our coming out here, as I think it

must be, I would like to point out that she did not let her chicks die in the nest. They were washed out of the nest in a cloudburst, as were the chicks of the Green Cardinals. She was such a sweet thing that I hate to see her maligned in print.”

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There is at present a world shortage of canary seed. It is being felt particularly heavily in Great Britain where prices are soaring. Ordinarily several thousand tons are imported annually from Australia but owing to drought little or none is available for export. Due to internal unrest only very small quantities are now coming out of Turkey. The Moroccan exporters have taken advantage of the situation by demanding exorbitant prices and the Spanish have followed their example. The result is that our leading dealers are having to ask as much as 120s. to 125s. per cwt. for the finest quality Spanish canary.

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In the September–October, 1960, number of the *MAGAZINE* there was a breeding report of the African Ring-necked Parrakeet, by T. F. Nixon. It was thought that this might be a first success. It transpires, however, that G. S. Mottershead, Director-Secretary, of the Zoological Gardens, Chester, was breeding them at Shavington over thirty years ago. He then kept them in a large, open flight, left them to their own devices and they bred quite successfully, even freely. George Mottershead says: “I never thought much about it at the time; in fact it would have amazed me if anybody had told me that they had not been bred in captivity before.”

* * *

Charles Everitt reports from the Edward Marshall Boehm aviaries: “We have been having a terrible time during the snow, one aviary completely destroyed and another badly damaged, with complete loss of all the tropical plants therein. The loss in birds was not as heavy as it might have been but quite a number of pairs were reduced to singletons, including the Twelve-wires. Although the blizzard was exactly four weeks ago we still have a lot of ice and snow about and the Delaware River has only just been cleared for navigation as far up as Trenton. For nights on end the temperature has been in the region of 5° to 10° and only in the 20’s during the day. We had a heat wave to-day (9th January) for it went up to 45° and now all the water on top of the melting ice makes walking very hazardous—not that we do much of it—but we do have to get around the aviaries.”

* * *

R. L. Blakely, Curator, Division of Birds, Lincoln Park Zoo, sends details of a new project. He writes: “The Commissioners of the

Chicago Park District have approved plans for the complete remodelling of the main Bird House. Temporary cages in the back of the building will be removed and that area will be landscaped with artificial rock. A shallow, salt-water wading pool and a deeper, fresh-water pool fed by a stream and waterfall will also be added. In the centre the large flight cage (100 ft. \times 25 ft.) will be removed. This will then turn the building into one large walk-through flight cage. The recently remodelled cages on the two opposite long sides of the building will remain. The spectators' galleries will receive lower ceilings and the skylights over these areas will be removed. This will serve the double purpose of keeping the free flying birds in the centre or back of the building and of eliminating reflections on the glass of the side cages. New offices will be constructed in conjunction with a darkened escape-proof entry way. Work on this project is scheduled to start very shortly."

* * *

Charles K. Lucas, President, Avicultural Society of Australia, says in a recent letter : " My new aviaries are now running well and my parrots have had a particularly good season. To date I have six Splendids flying, three Many-coloureds, three Bourkes, twelve Turquoisines, seven Peach-faced Lovebirds and eight Princess Alexandras with another five still in the log. One of my hen Princess Alexandras has turned out to be a champion. Last season she was double-brooded and had two lots of two, all successfully reared. This is the first time in sixteen years, since I have been keeping these birds, that I have had a double-brooded hen. This year she has excelled herself ! She laid five eggs, hatched five young and reared all five in the first nest and then went back to work and laid another five eggs, all of which were hatched about a fortnight ago and all of which are doing well. If the second clutch all survive, it will amount to a total of ten young birds in the one season—surely an outstanding record !

The finches are also doing well and for the first time in my avicultural career I have a nest of three young Red-faced Parrot Finches due to fly any day.

I think the season has something to do with results like these. We had an exceptionally rainy winter, which commenced with seven inches of rain in April and heavy and consistent rain has fallen up until about three or four weeks ago. Although the result of all this was that the aviaries became somewhat waterlogged, the excessive moisture possibly stimulated the birds and led to these good results."

A. A. P.

* * *

REVIEW

IM UNBEKANNTEN AUSTRALIEN. Dem Lande der Papageien und Prachtfinken (In Unknown Australia the Land of Parrots and Grass-finches) by KLAUS IMMELMANN, Verlag Gottfried Helene, Pfungstadt/Darmstadt, Germany, 1960. Price 14.80 DM.

This book is a "must" for all who are interested in Australian bird life and can read German. The author, who has previously made detailed studies on Zebra Finches in captivity, spent a year in Australia, primarily in order to study this species in the wild. He succeeded not only in studying wild Zebra Finches under very different conditions in various parts of Australia but also in observing the other Australian estrildines, and many other birds and mammals, from Duck-billed Platypuses to *Homo sapiens*.

His observations were often made under conditions of hardship having to contend with adverse weather, flies, and mosquitoes. The Australians met by the author seem to have been a likeable and hospitable people, but he says many of them had a strong love of killing and shot almost any living creature they saw, whether of use to them or not and whether proscribed or protected by law. In view of this shooting and of the more justified mass slaughter of zosterops and various psittacines in defence of the crops, it seems hard on genuine aviculturists over here that the export trade in Australian birds has been completely banned; desirable though it was to check its excesses.

Here are a few nuggets from this goldmine of information on many of our favourite aviary birds. Whereas in most parts the Zebra Finch breeds when conditions are favourable and only the male searches for and carries nesting material, in the arid regions of central Australia the species starts to nest as soon as it starts to rain and both sexes fetch and carry. This is an adaptation to the very hard living conditions, as in this area birds can only rear young successfully in the brief period of abundance that follows the irregular and uncertain rainfall. They must, therefore, start to breed as soon as it starts to rain, even though they are *then* just as hard up for food supplies as before.

The Crimson Finch has largely deserted its original haunts among the Pandanus trees and in many areas now breeds only in and on buildings. In the centres of the large cities, however, introduced European and Asiatic species are dominant. The Spice Finch seems to be replacing the more beautiful native estrildines in parts of northern Australia but it is not known whether this successful and versatile species was introduced or got to Australia by its own efforts.

In spite of intense persecution by man many of the magnificent parrakeets and cockatoos are as common or commoner than ever. Others, however, are decreasing. The author points out that the natural ability that many Australian species have evolved to enable

them to recuperate after their numbers have been decimated by drought, is now an important factor in their survival in the face of human persecution.

This book can be recommended to all readers of the AVICULTURAL MAGAZINE but particularly those interested in the grass finches, the Gouldian, Bicheno, Firetailed, Crimson and Zebra Finches, on all of which the author gives a great deal of extremely interesting information.

D.G.

* * *

CORRESPONDENCE

FRENCH MOULT RESEARCH AND CROP-MILK IN PARROT-LIKE BIRDS

Reading through the back numbers of AVICULTURAL MAGAZINE my attention was attracted by a report concerning an investigation on French moult sponsored by the National Council of Aviculture (A. M. 1957, No. 2, page 79). It is stated that there is good reason to believe that all parrot-like birds feed their young on crop-milk for at least the first week after hatching and that French moult may, in certain cases, be associated with a deficiency in this crop-milk.

If indeed parrakeets feed their offspring on crop-milk, it is logical that the production of this liquid commences at the end of the breeding period when young birds are expected. An experience I had during the past season (1960) with a pair of Bourke's Parrakeets shows, however, that this is definitely not the case.

According to my notes this particular pair started their second clutch on Tuesday the 7th of June and the last (fourth) egg was laid on the 13th. The hen started brooding on Sunday the 12th of June. Two days later (the 14th) a young Red-rumped Parrakeet which had just hatched in an incubator (!) was placed in the nest of this Bourke's for lack of anything better. I did not expect the Bourke's hen would accept this chick and even if she did she would not be able to feed the young, not having "crop-milk" at her disposal. On inspection in the evening of the same day, however, some food could be seen in the little crop of the chick. There were two more fertile Red-rump eggs in the incubator and when these hatched a few days later these chicks, too, were placed under the Bourke's. All three young grew up normally and were reared to independence by both foster-parents. They are still in my possession (January, 1961), and they are healthy birds, perfectly feathered and excellent flyers, without a trace of French moult.

Conclusion:—Though this is a report of only one case, it is a striking one and it raises some doubt as to the existence of crop-milk in psittacine birds. If, indeed, crop-milk is a necessity for the young chicks to grow up normally my Bourke's hen must have been able not only to produce it at a very awkward time when she could not possibly expect young ones, but moreover the crop-milk must have been of good quality too, evidenced by the fact that my three Red-rumped Parrakeets are in such a fine condition.

Dr. H. D. GROEN,

HAREN,
GRONINGEN,
HOLLAND,

THE NATIONAL SHOW

An attack against the British bird section at the National Show by Derek Goodwin in your MAGAZINE, should not be allowed to go unanswered. May I point out that the size of cages for each species has been standardized by the British Bird and Mule Club and the "National" show committee would not accept specimens in cages not up to the standard required? Your correspondent states that "everyone does not know that the birds are not kept in those little show cages." My answer to that is, there is a British bird corner near the exhibits, where any questions concerning British birds, their care and management, will be fully answered. Of course, there are many people who are only too anxious to condemn, without first hearing, or wanting to hear, the full facts of any case. My own opinion regarding the size of British hardbill show cages is that they are just right. Larger ones would vastly increase the risk of damage to the occupant during transit; a fact that Mr. Goodwin should know, if he has ever kept birds.

British bird fanciers, indeed all bird keepers, have always had "fervent" enemies. The enemy being people who are almost entirely ignorant of the subject. However, this branch of Aviculture, the British fancy, still flourishes and its growth is steadily increasing.

In conclusion, I sincerely hope that Mr. Goodwin's "horrifying" experience of seeing a Norwich canary, will not lead to nightmares.

A. GREGG.

Secretary, County of Yorkshire British Birds and Hybrid Club.

LINTONHOLME COTTAGE
BRACKENWELL LANE,
NORTH RIGTON, HUBY, NR LEEDS.

I am grateful to the Editor for giving me an opportunity to reply to Mr. Gregg's letter.

I am aware that the sizes of the "British hardbills" show cages are decided by the British Bird and Mule Club. That does not alter the bad impression that these tiny cages give to the general public who visit the shows; it merely indicates how blind or indifferent those responsible are to the true interests of aviculture.

No doubt anyone angered by the sight of a Hawfinch or some other bird in its narrow cell *ought* to seek out the "questions corner" and ascertain if the birds really are kept in such cages all the time. But such people are not likely to wish to palaver with those whom they consider, however mistakenly, to be addicts of a cruel and unjustifiable pastime. Certainly there is not, as I think there should be, a prominent notice pointing out that the birds are not kept permanently in small cages.

I have kept birds but should not wish to risk their lives just in order (*if I were lucky*) to have them judged better than someone else's on a largely arbitrary and artificial standard of excellence. It is evident, however, that those who show "British softbills" manage to transport their exhibits successfully in spite of the large and attractive show cages that most of them use. And many of these "soft-bills" have plumage, beaks, and feet more easily damaged than those of finches or buntings.

I am happy to be able to assure Mr. Gregg that I have not suffered recently from nightmares. This suggestion of his seems, however, to have merit. Some nightmare sufferers, now oppressed by psychiatrists' assurances as to the intrinsic source of their bad dreams might be happier, and nearer the truth, if they regarded the less pleasant sights at the National Cage Bird Show as the causative factor.

DEREK GOODWIN,

40 FRANKFURT ROAD,
S.E. 24.

I was glad to see in the last issue of the AVICULTURAL MAGAZINE one published protest concerning the National Show. I visited it on the Saturday. My wife, who was with me, was so distressed by the sight of the birds on the dealers' stands, and the condition that they were in, that she has decided not to visit the show in future.

These people have become so accustomed to the conditions under which so many birds are imported and sold that they are quite unaware of the reputation which aviculture is gaining for itself. Country after country is framing laws which forbid the export of birds, and it is the conditions of export and the appalling mortality which have helped to bring this about. We, who are in touch with ornithologists as well as aviculturists, are aware that unless serious action is taken foreign birds will soon be unobtainable, and it is the dealers who will have brought this about, and the aviculturalists who, through their earlier indifference, will suffer for it.

I would add that I wrote a strong letter of protest at the time to *Cage Birds*, who replied in some detail but, as I anticipated, did not print anything about it.

C. G. O. HARRISON.

178 MANTILLA ROAD,
LONDON, S.W. 17.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

THE AVICULTURAL SOCIETY RECEIPTS AND PAYMENTS ACCOUNT

Year ended 31st December, 1960

RECEIPTS

	£	s.	d.	£	s.	d.
To Balance at Bank, 1st January, 1960			359			0 2
„ Subscriptions						
„ Arrears		9	9			10
„ Current		1,030	17			5
„ In advance		191	12			5
„ Life		77	13			4
			—	1,309		13 0
„ Donations				41		7 8
„ Sales of Magazines				122		13 0
„ Sales of <i>The Anatinae</i>				3		15 7
„ Sales of <i>Grebés</i>				13		4
„ Sales of surplus books				120		0 0
„ Sales of waterfowl rings				15		6 6
„ Sales of coloured plates				18		1 8
„ Advertisements				312		10 6
„ Dividends				68		1 0
„ Miscellaneous receipts				2		2 6
				—		
				£2,373		4 11

PAYMENTS

By Printing of Magazine	£	s.	d.
„ Coloured plates			1,474 15 4
„ Authors' separates			198 0 10
„ Sundry printing and stationery			21 2 6
„ Printer's service charges			60 5 9
„ Honorarium to Editor			32 8 6
„ Translations and services			100 0 0
„ Secretarial			4 4 0
„ Preparation of Index			52 0 0
„ Advertisements, leaflets, etc.			15 15 0
„ Expenses at Council Meetings			14 13 10
„ Medals and engraving			8 12 9
„ Purchase of waterfowl rings			32 2 1
„ Postages			34 8 6
„ Bank charges and cheque books			44 5 8
„ Miscellaneous expenditure			11 0 0
			—
			14 19 10
			—
„ Balance at Bank, 31st December, 1960			2,118 14 7
			254 10 4
			—
			£2,373 4 11

I have examined the above Account with the books and vouchers of the Society and certify it to be in accordance therewith. I have verified the Bank balance.

LONDON.

31st January, 1961.

J. WATKIN RICHARDS }
Certified Accountant. } Hon. Auditor.

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1 lb. 3/6	1 lb. 4/-	1 lb. 4/-	1 lb. 6/-	1 lb. 4/6
3½ lb. 11/9	3½ lb. 13/6	3½ lb. 13/6	3½ lb. 21/-	3½ lb. 15/-
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- C. F. M. BILLET, Kerkstraat 35, Ubach over Worms, Holland. Proposed by A. A. Prestwich.
- Mrs. M. A. BROADHEAD, Bury Hall, Ashill, Norfolk. Proposed by Miss K. Bonner.
- H. BRYAN, 101 Chester Road, New Oscott, Sutton Coldfield. Proposed by A. E. Huyton.
- L. J. CARTLIDGE, Box 392, Pennington-Harbourton Road, Pennington, New Jersey, U.S.A. Proposed by C. Everitt.
- L. CLERC, 4 rue d'Alsace Lorraine, Oran, Algeria. Proposed by A. A. Prestwich.
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- P. W. MURPHY, 219 So. Flenniken, El Dorado, Ark., U.S.A.
- H. PEARL (Change of Address), 123B Queensway, Hatfield, Salisbury, Southern Rhodesia.

NEW MEMBERS

Correction

For LAO WEI-CHING, read WEI-CHING LAO.

The thirty-eight Candidates for Election in the January–February, 1961, number of the *Avicultural Magazine* were duly elected members of the Society.

CHANGES OF ADDRESS

- Mrs. MURIEL M. ADAMSON, to P.O. Box 2237, Kronprindsens Gade Sta., St. Thomas, U.S. Virgin Islands.
- D/Sgt. R. S. CARDY, to 1st Bn. Irish Guards, Caterham Barracks, Caterham, Surrey.
- DEREK GOODWIN, to 40 Frankfurt Road, London, S.E. 24.
- W. M. HAWLEY, to 7787—15th Avenue, New Westminster, B.C., Canada.
- FR. HUYBRECHTS, Stw. op Leest 122, Hombeek, Belgium.
- DR. LEWIS F. KIBLER, to 1373 North Main Street, Jamestown, New York, U.S.A.
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AVICULTURAL MAGAZINE

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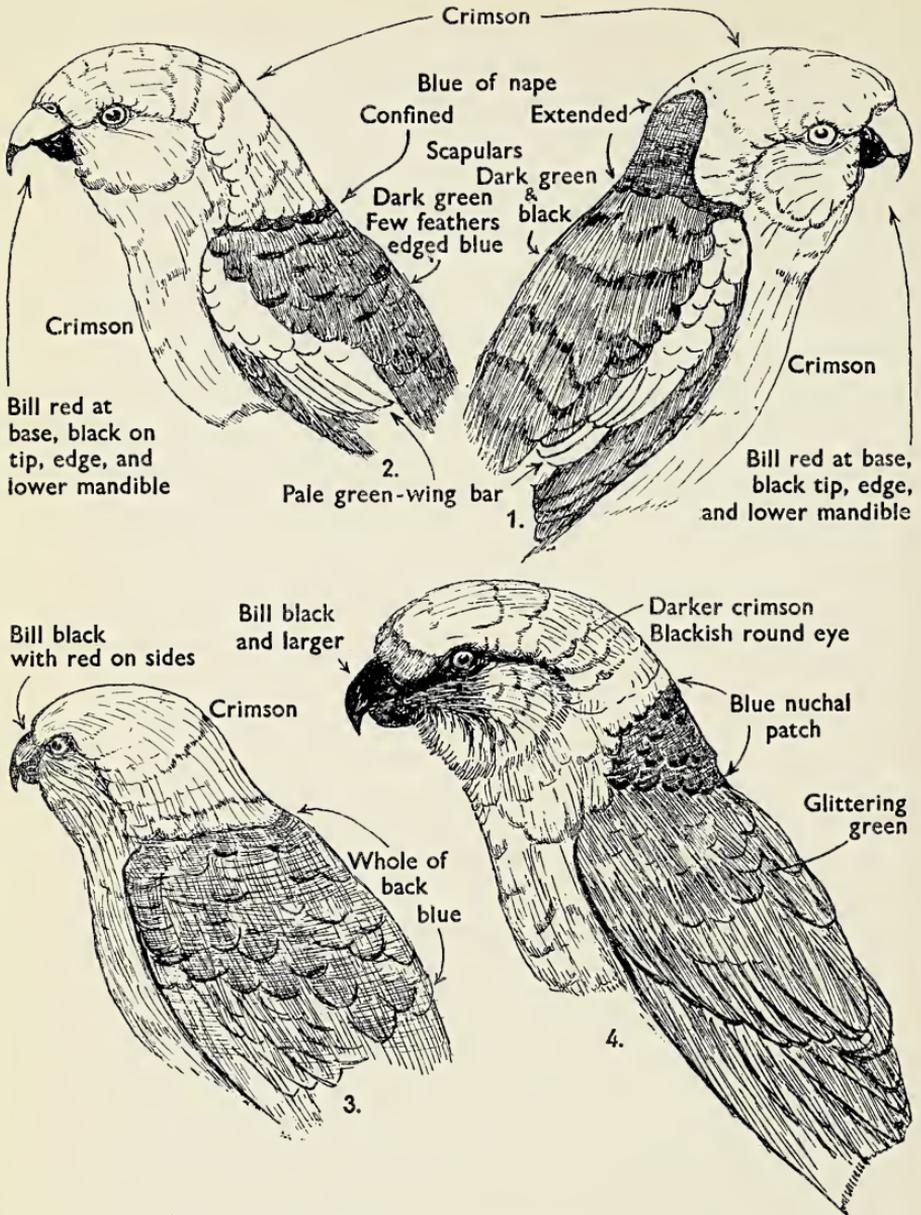
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1. GREEN-WING KING ; 2. WILHELMINA'S VARIETY ;
3. SALWATTY KING ; 4. RED SHINING PARRAKEET

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MAY-JUNE, 1961

CRIMSON-WINGS, KINGS, AND SHINING PARRAKEETS

Their affinities and differences

By E. N. T. VANE

(Great Missenden, Bucks., England)

This series of extremely handsome, large parrakeets range over the south-west regions of the Pacific, being found in Australia and New Guinea, whence they extend in one direction through the islands of the Moluccas and Celebes, and in the other—after a distinct break in the range—to the insular groups of the Fiji and Tonga Islands. Peters listed them in his "Checklist" as :—

Aprosmictus, Gould (1842)—The Crimson-wings.

Alisterus, Mathews (1911)—The Kings.

Prosopeia, Bonaparte (1854)—The Shining (or Musk) Parrakeets.

The sketch shows :—

1. *Alisterus chloropterus chloropterus* (male), Green-wing King.
2. *Alisterus chloropterus wilhelminae* (male), Wilhelmina's variety.
3. *Alisterus amboinensis dorsalis* (either sex), Salwatty King.
4. *Prosopeia tabuensis splendens* (either sex), Red Shining Parrakeet.

It is difficult to convey the impression of colour values in a black and white sketch, but the distinction between the two first races is fairly apparent, as apart from the blue markings on the nape and hind neck they are almost identical in males and entirely so in females. The scapulars of *chloropterus* are almost completely blackish green, whereas in *wilhelminae* some of these feathers are bordered terminally with deep blue, at least in the specimens compared in the British Museum.

Although Figs. 3 and 4 resemble each other superficially in life, their true differences are slightly exaggerated in the sketch. In the first place the three species of *Alisterus* are all much the same size—about

15 inches in overall length as compared with the larger *Prosopeia* (some 18 inches long). The crimson colour is deeper in the latter, especially in the face where it becomes much blackened in the ocular region; also the green of the body, although of similar "tone" value, is distinctly more glittering in character. In *splendens* too, the blue nuchal patch is smaller, and the primaries and edge of wing are lighter blue; no blue shows on the under tail-coverts; the under wing-coverts are brighter blue with some red flecks. In the specimen of *dorsalis* from which the sketch was made, practically the whole of the scapulars and back were entirely deep blue; though a specimen that lived in my aviaries for several years—during which period she established her sex by laying several eggs—only had a small, narrow area, little more than a ring, as her nuchal patch, though most of the feathers of the scapulars were broadly edged terminally with blue, and the lower back and the upper surface of the tail were all deep blue. This specimen was loaned for preservation when it died, but unfortunately the friend who had the skin was killed in a street accident and I was unable to secure its return under the circumstances and it was lost entirely. The sexes of *dorsalis* are alike and neither possesses a pale wing bar—this in itself seems unusual within one genus (some sexually alike, others unlike). The bill is blackish with reddish areas on the sides.

In *Prosopeia splendens*, the bill is very much larger and of different shape. Although the sexes are alike, the males are larger generally and particularly in the head and bill, seldom can an error be made in choosing among live specimens.

Owing to the striking similarity of the general colour pattern between some species, the three genera have given rise to considerable confusion and consequent taxonomic revision so that it is far from an easy matter for anyone not well acquainted with these changes, clearly to distinguish them; and reference to earlier authors may well increase the difficulty. Indeed, if some recent references to the large, sexually dimorphic, *Eclectus* (?) Parrots from the Solomon Islands, *Lorius roratus solomonensis* (Rothschild and Hartert) (emended to *Lorius* in Peters), as the "King Parrot" are allowed to pass without comment the confusion is likely to increase.

To clarify this last point which is of minor consideration here, the name *Eclectus*, Wagler, was in constant use for this genus of parrots of such unique sexual dimorphism from 1832 until 1915, when Mathews discovered that Boddaert had used a prior title *Lorius* (1783) which he emended to *Lorius*. Thus under the priority rule the well-established *Eclectus* was displaced much against the wishes of many scientists who had used the term for the whole of their lives. In spite of this, the name persists in common usage in many parts of the World to this day. To apply the common name of "King Parrot" to a species which was

named the Solomon Eclectus Parrot by its authors in 1901, is bound to lead to future confusion. Indeed, Ernst Mayr (*Birds of South-west Pacific*) used this name, which was followed by Cain and Galbraith (*Ibis* 1956, p. 129) and thus repetition adds to the trouble. Admittedly this name may be used by local residents or natives in a locality, but when another species has been accorded world-wide use of the same name for many years (in this case over one hundred), this improper appropriation of the same name is to be discouraged.

Reverting to the three genera under consideration, they are characterized by their large size, some 14 to 18 inches in overall length including the long, flat, wedged-shaped tail, of which the rectrices are not distinctly tapered distally, nor much graduated, and the tips are rather broad and rounded. (The Crimson-wings have a comparatively shorter tail.) Next, by their brilliant color patterns and general shape, in which respect the similarity between the Fijian and Moluccan species is particularly noticeable; also the sexes in these races are alike whereas in the Kings of Australia and New Guinea the sexes differ.

HISTORICAL

Gould first established the genus *Aprosmictus* when he wrote to the Zoological Society in 1842, from Australia, saying that on closer acquaintance with the genus *Platycercus* he was of the opinion that two species, namely *erythropterus* (Crimson-wings) and *cyanopygius* (Kings) should be removed on account of differences in habits, colour pattern, and certain anatomical and morphological differences, enumerated in his letter which was read at the Society's Proceedings. Some years later, in 1865, when writing his *Handbook to the Birds of Australia*, Gould realized on reflection that Crimson-wings and Kings also required to be separated since their colour patterns were quite different; their tails too, had different formulae. He may have also recalled writing elsewhere, how he had watched flocks of Crimson-wings feeding, and what a wonderful spectacle they made, "especially when there were a number of adult males in the flock, when their crimson shoulders stood out against all surrounding objects." Now this does not agree as a fair description of a species named "*aprosmictus*" which literally means "one who does not mix"—"a solitary individual normally". So he decided to remove the more sociable Crimson-wing to a new genus which he called *Ptilistes*, under which title they appear in the B.M. Catalogue.

Having named two species as co-types of *Aprosmictus* in 1842 Gould simply removed *erythropterus* to be the type of his new genus, and left *cyanopygius* behind as the type for the less "Non-mixing" genus. In my view Gould did this deliberately and knew quite well what he was doing. Quite incidentally, the name *cyanopygius* was subsequently revised to *scapularis*. A modern analogy might be to say that there

had been two "joint managing directors"; one retired to take up a new post, leaving the other in charge.

Gould was not to know that during his absence, Gray had been working in England incessantly to produce a better classification of birds and had published several works on the subject, in one or more of which, he had listed the genus *Aprosmictus* bracketing thereafter *erythropterus* as the type. Either Gray did not notice that Gould had named two types, or he attached no significance to the fact. Quite possibly at that time there was no rule to give significance thereto.

In 1911 Mathews discovered what he called "Gould's blunder", and by that time there was a rule. The question is, how could Gould have complied with rules of which he was not aware, and which had probably not been made at that time, possibly not until some years after his death. Be that as it may, Mathews cancelled *Ptistes*, as invalid, removed the name *Aprosmictus* from the Kings (*cyanopygius* = *scapularis*) where it had been in use for seventy years since 1842, and transferred it to the Crimson-wings (*erythropterus*) because he contended that Gray had so designated the type, simply by adding it in parentheses after the generic name. Although careful search was made in several of Gray's works on genera and species, no definite statement could be found anywhere to the effect that "I hereby subsequently designate . . . as the type" or "I hereby restrict . . . as the type". Thus the Kings, *scapularis*, became nameless, so Mathews named them "*Alisterus*" in honour of his own son. He named *scapularis* as the type and listed the species which the genus embraced, the Australian Kings (*scapularis*), the Green-wing Kings of New Guinea (*chloropterus*), and the "Island" Kings (*amboinensis*), of which further sub-species have since been discovered.

Not unnaturally many ornithologists who had been referring to these birds for over seventy years by their former title did not approve of the change, and some even refused to recognize the new proposals. This appeared to annoy Mathews intensely, and he wrote to *Ibis* (April, 1916) accusing Ogilvie-Grant, and others who shared his view, of personal bias. In 1917 Mathews in his excellent work, *Birds of Australia*, Vol. VI, repeated all this taxonomic wrangle, again listing all the Kings covered by *Alisterus* which in fact, comprised all the Australian, New Guinea, and Moluccan species then known, adding:—"All the preceding generally agree in size and coloration, and have the same wing formula and bill structure, and their range is East Australia and the Moluccas and New Guinea. It should be noted that as far as we know them, the females are quite different in coloration, having the head and neck green, and other differences . . .". He then proceeded to point out how the Fijian genus differed from all these, in that the sexes were alike, and other differences of characters.

In this observation, even Mathews was at fault, since the "Island"

Kings do not differ in colour pattern between the sexes. This fact, coupled with the similarity of colour pattern, led me to the conclusion as many early writers had believed, that *Alisterus amboinensis* and *Prosopcia splendens* (later regarded as a subspecies of *tabuensis*) were very close to each other, and eventually led to many subsequent discussions with the late Duke of Bedford, who as most aviculturists know, was ever ready to assist anyone with psittacine problems. He had considerable experience with both genera in captivity, and therefore I am pleased to be able to quote from his writings which he amplified to me in discussions in days gone by, in the hope that this may help others to distinguish between these three genera, which are dealt with in turn as follows :—

1. Genus *Aprosmictus* (in Peters) *The Crimson-wings*

Only two species are recognized though these have been separated further into local races or subspecies. Obviously they are closely related to the Kings or Gould would never have regarded them as of the same genus, nevertheless, as anyone who has kept both for some time will agree, each has peculiarities of habit. Races of Australian birds, *erythropterus*, have been separated on the characteristic of size alone, and the New Guinea race is very similar ; only differing in the smaller size and having less black on the back in the males. Sexes are different as the females do not have black backs though there is some red in the wing ; immatures all resemble the adult female, full adult plumage not being attained until they are over two years old, therefore the selection of true pairs from young birds is not possible.

The second species, *jonquillaceus*, is found in the islands of Timor and Wetar, the sexes are more difficult to distinguish at any age as the males have no black on the back, females only differing from them by the amount of blue present on the upper wing ; even this appears to vary individually so that some females are quite distinctly marked with blue whilst others are almost lacking, and in the males the colour is more pronounced in some than others. Certainly one specimen examined was labelled as a female, but looked blue enough to be a male. The late Duke rated these birds very poorly in his estimation:—

“For many years I longed to possess the Timor Crimson-wing (*Ptistes jonquillaceus*) [the old generic name], but when my ambition was at length realized I found that the whole order of Parrots does not contain a more ill-conditioned brute, nor one more tiresome from the avicultural standpoint—not only does he pluck himself with more frequency and persistence and less excuse than any other psittacine bird, but he kills his wife as a matter of habit, and, if he should be tame (?), he hates the human race—and especially his owner—with an intensity that must be seen in order to be believed !” (Bedford, AVICULTURAL MAGAZINE, 1950, p. 100).

The interesting point about this genus is that there are two species, one of which inhabits mainland regions and the sexes are different ; whilst the other is of insular origin and the sexes are difficult to distinguish. Both are admittedly " wife-beaters ", but the island race appears even more evil-tempered in this direction than the mainland bird. A parallel will be mentioned later.

Before leaving this genus, mention should be made of a very beautiful bird which was illustrated in Gould's *Birds of New Guinea* as *Aprosmictus insignissimus*. This was mentioned by Peters (p. 250) who noted that it was now considered to be a natural hybrid between *Alisterus s. scapularis* \times *Aprosmictus e. erythropterus*. On reference to Prestwich's *Records*, p. 179, it transpires that this cross has been produced on at least two occasions in captivity, and the brief description by Jean Delacour of a male of a pair he saw agrees well with the illustration in Gould mentioned above. Thus might aviculture confirm such doubtful matters and prove the close affinity of the two genera beyond dispute.

2. Genus *Alisterus* (in Peters) which comprises three species :—

- (a) *scapularis*, the Australian Kings.
- (b) *chloropterus*, the New Guinea Green-wing Kings.
- (c) *amboinensis*, the " Island " Kings of Northern New Guinea, the Moluccas and Celebes.

(a) *scapularis*. The Australian Kings are well known to many aviculturists, the males being magnificent, showy birds with the head and most of the underparts bright scarlet ; the wings and mantle dark green with a touch of blue where the green of the mantle and the red of the head meet, and with a longitudinal light green stripe on the upper wing-coverts ; the tail very long, broad, and flat and considerably larger than in the Crimson-wing. The female is much more soberly clad, being mainly dark green without blue on the hind neck ; a reddish wash on the greenish underparts ; the green wing-stripe is usually absent, though I have bred some hens in which this has developed to a certain degree. I also possessed one hen with a distinct red fleck on one side of her head. She lived for many years in my aviaries and eventually laid eggs so I had no doubt about her maturity or sex.

Only two races were recognized by Peters, though more have been proposed, but most probably did not prove to be sufficiently constant in variation to merit racial distinction. These differences referred to size rather than colour. Immature birds resemble the adult female but young males soon begin to acquire some reddish tinge to the upper mandible whilst the females' remain dark, though some adult females sometimes show a little orange on the base of the mandible, but

not enough to be confused with the really orange-red bill of the adult male. It takes at least two years for adult plumage to be assumed. Occasionally a young male shows considerable flecks of red in the parts that will eventually become entirely so in his first moult. But the number of aviculturists who have acquired a supposed pair of Kings only to find that they had an adult and an immature male will confirm that young birds are impossible to sex.

(b) *chloropterus*. The New Guinea Green-wing Kings are very close to the Australian species, the males, if anything, being even more handsome. As so often happens among psittacines in the tropics the more northerly population are somewhat brighter in colour and slightly less in size.

The red of the Green-wing King is darker ; there is much more blue on the nape ; the characteristic wing-stripe is broader and a much paler apple green. Again, the females are duller than the males and immatures resemble the females. However, these Kings inhabit the lower slopes of the mountain ranges of New Guinea and are frequently separated by physical barriers from neighbouring races. This appears to have resulted in the naming of several sub-species, some of which are scarcely tenable, since differences are attributed to one sex only in some cases, whereas elsewhere another subspecies has been nominated for a slight difference in the opposite sex. When it is realized that the species takes three years to acquire full adult plumage, it is obvious that individual variation is bound to occur which collectors, in their eagerness to discover new races, might well imagine a greater variation in their specimens than did in fact exist. More recent authors, such as Peters and Mayr have synonymized some of these races.

Females of *chloropterus* and *scapularis* can be distinguished from each other by the smaller size of the former, which also have a deeper blue rump ; darker reddish wash on the underparts, and the under tail-coverts are blue basally with red edges as compared with those of *scapularis* which are green basally with red edges. These differences are not nearly so easy to observe in a living specimen as their enumeration on paper would suggest.

Some years ago I reared a number of hybrid *Alisterus c. chloropterus* \times *Alisterus scapularis* but only retained one male specimen until it attained full adult plumage when three years of age. This bird was almost indistinguishable from its male parent. The *chloropterus* nominate race is clearly distinguishable by the "lozenge-shaped" patch of blue on the nape and hind head (see sketch).

(c) *amboinensis*. The "Island Kings" have a similar colour pattern to others of the genus *Alisterus* with two important differences. The colours are generally much darker in hue on average ; and there is no near vertical, light wing-stripe. Moreover, females and immatures

are almost identical with the males—quite unlike the Australian or other New Guinea species.

Various sub-species are recognized as populations of different islands, which only differ from each other in size or slight coloration to some degree. In one subspecies, *hypophonius* from Halmahera, green is lacking in the plumage, being replaced by blue, and the crimson underparts are also purplish washed.

The really interesting points are that instead of the sexes differing—as Mathews appeared to believe—they are alike in colour pattern. Secondly, these “Island” species are less even-tempered than other *Alisterus*—a characteristic of singular significance in the view of the late Duke of Bedford who frequently discussed this matter with me. He drew an interesting analogy between the two genera *Aprosmictus*, Crimson-wings, and *Alisterus*, Kings, emphasizing that each included one species of mainland location in which the sexes were dimorphic yet tolerably well disposed towards each other; as opposed to which, each genus contained a species in which the sexes were alike and extremely bad tempered, both being of insular location. This is supported by the following avicultural observations:—

“Between the species of *Alisterus* in which the sexes are alike and those in which they differ in appearance there are fairly marked points of resemblance and also fairly marked points of distinction. In voice the former group are definite Kings, but in temperament both sexes are fierce birds, addicted to murder, which the Australian King is not.”

“The climate of the East seems, indeed, to have a bad effect on the manners of the Parrakeets of the Australasian group” (Bedford, AVICULTURAL MAGAZINE, 1950, p. 99).

A female Salwatty King, *A. a. dorsalis*, lived in my own aviaries for a number of years. Being unable to procure a mate of her own species, she was provided successively with two Australian Kings, *scapularis*, as mates. In spite of her smaller size, she eventually killed both of these. Thereafter she was given a cock Pennant, *Platycercus splendens*, with whom mating was observed and she went to nest and laid eggs which were not fertile, though she sat well. This confirmed the explanation offered by the Duke, that male Kings, accustomed to a quietly garbed, respectable looking female, failed to recognize this “over-dressed” specimen as a suitable partner at all. So enraged was the hen at this affront to her sex, that she never forgave them, and thereafter refused to have anything to do with them.

Nevertheless, the Duke did succeed in crossing a Crimson-wing male, *Aprosmictus erythropterus*, with a female of the small Sula Island race, *Alisterus amboinensis sulaensis* (see Prestwich, *Records*, p. 170; also Tavistock, *Parrot-like Birds*, p. 248). Although these hybrids were never proved fertile, it was fairly evident that both sexes were reared.

Both sexes had red patches in their green areas when immature, and took three years to assume full adult plumage.

“ A three-year-old . . . hybrid . . . is now moulting into adult plumage and is showing a quantity of light yellow-green feathers on each wing. It is curious that by crossing a Parrakeet with a red wing-bar with one with no wing-bar at all you should produce offspring with a pale yellow-green wing-bar rather like that of the other species of Kings. The wing of a Sula Island of either sex is uniform dark green ” (Tavistock, AVICULTURAL MAGAZINE, 1929, p. 256).

This only emphasizes the absolute unpredictability of hybridizing, and raises another interesting point. A species cannot be persuaded to hybridize within its own genus, yet does so with a species of another closely related genus and succeeds in producing progeny. Neither should it be forgotten that *Aprosmictus insignissimus* of Gould's work previously referred to, is now believed to be a cross between members of these two genera.

Before leaving *Alisterus* reference must be made to the excellent review of the genus by Prof. O. Neumann in 1926. He took the view that they were all of one species, or “ Formengruppen ” which he designated *amboinensis*, and listed all the races as subspecies thereof. He gave very useful “ keys ” as aids to identification, and pointed out one distinctive feature, namely that immature specimens had a tail characteristic, the rectrices were pointed at the tips with pinkish edgings, whilst in adults that had moulted out, the tips were then rounded and the pinkish edges lacking. This would enable museum specimens to be more readily identified and give some indication of the age of a specimen. However, so far as I know, this species has only been bred in captivity once, in 1940, when no observations were recorded. Certainly this does not apply to the Australian species, for I can well remember how difficult it was to remove well-grown young birds at the end of the season, one had to be very careful not to take out the adult breeding hen in error, and it was quite impossible to distinguish them with certainty.

Neither Peters nor Mayr accepted the view that *Alisterus* were so closely allied as to be of one species, and regard them as of three specific forms, which avicultural experiences certainly support and may even suggest that the division between the Australian and New Guinea “ mainland ” species on the one part and the “ Island ” (*amboinensis*) on the other part is even greater.

3. Genus *Prosopeia* The Shining Parrakeets

Many instances could be cited to illustrate how the similarity of colour pattern and general shape between this genus and *Alisterus amboinensis*, the Island Kings, has led to the almost involuntary association of the two as close allies. Even Latham is reputed to have

regarded them as representatives of the same species. It therefore remains to indicate their points of difference.

Prosopelia are generally much larger in size, especially in the bill, which is deeper, blacker, and rougher on the surface. Although the sexes have the same colour pattern, they differ in size, the males being larger particularly in respect to the head and bill. Their colour too, is darker, even in the *splendens* subspecies, the other races of *tabuensis* being almost wine coloured. The green in all of them although of equal "tone" is much more glittering in character; they are noticeably darker around the lores and face; the wing formula is slightly different.

For more practical comparison of habits and temperament, let us consider once more some of the observations of the late Duke of Bedford who had several specimens in his collection at different times:—

1. "On account of a certain superficial resemblance in their colour scheme they have been classed with the King Parrakeets and even—Heaven knows why—with the Broadtails. As a matter of fact they have nothing in common with either and are totally different in character and habits. Not much seems to be known of their nesting, but two eggs appear to be laid in a hollow tree and the sitting hen is fed by her mate" (Tavistock, *Parrots and Parrot-like Birds*, p. 186).

Casey Wood (Emu, 1923) recorded three eggs in the nests he found.

2. "I do not think that, beyond the fact that they both belong to the same order of birds and have a certain superficial resemblance in form and colour, there is the least affinity between the members of the subgenera *Alisterus* and *Pyrrhulopsis* [= *Prosopelia*]. Having kept both, I can say with confidence that it is difficult to find two groups of Parrakeets more utterly unlike in every respect" (Bedford, AVICULTURAL MAGAZINE, 1950, p. 99).

3. "Old writers, misled by a certain superficial resemblance in form and color arrangement, imagined that they were nearly related to the Kings (*Aprosmicti*) [= *Alisterus*], but as a matter of fact they are sharply differentiated from the latter by their larger bills; the peculiar silky texture of the green areas of their plumage, their musky odor, and by nearly all their manners and habits. They form, indeed, a small and very distinct genus confined to the Islands of the Fiji group. There are five species or subspecies, but of these only two are strikingly distinct."

"The sexes are much alike, the female differing in the smaller size of the head and beak; and the young also appear to resemble the adults to a considerable degree save that their bills, instead of being black, show a considerable amount of whitish horn colour" (Tavistock, AVICULTURE (U.S.A.), 1931, p. 297).

Bahr (*Ibis*, 1912) remarked that the eye of nestlings was brown, that of the adults orange to yellowish, but not a sexual distinction.

When an attempt at hybridizing the two genera was made in the Duke's aviaries, although the birds appeared to tolerate each other, the eggs were infertile.

Thus it is fairly conclusively shown that there should be no difficulty in distinguishing any of these birds, in spite of external similarities. And the affinities between the two are not close at all, and even the geographical break occurring between them seems to emphasize this fact.

The accompanying sketches may make the points of difference easier to appreciate, although it is difficult to express difference in colour values in black and white.

* * *

BREEDING OF THE BROWN MANNIKIN

Lonchura fuscata

By A. MARTIN (Stockport, England)

A pair of Brown Mannikins came into my possession in February, 1960. They had been imported by the late Mr. W. J. C. Frost in 1958. I had only once before seen this species, in 1928 when I was acting as Curator to the late Mr. G. H. Gurney, who then informed me that the pair in his collection were Cinnamon Tuxas. I have been unable to ascertain the origin of this name but assume it to be the native name in Timor.

I kept them in my bird-room until mid-May when I turned them out into my aviary. They quickly settled down and did not appear to mind the few other birds—two pairs of Budgerigars, a pair of Golden-breasted Buntings, and a Red-headed Finch.

By the end of May they were busy carrying dried grass and making a nest in an old Budgerigar nest-box. The first egg was laid on 1st June. Both birds seemed to take it in turns to occupy the nest-box. I did not interfere with them in any way, but after they had been sitting for about eighteen days I examined the box and found four eggs, all of which were infertile. As perhaps one might expect they were pure white, rather elongate. I cleaned out the box and the Mannikins were very soon busy carrying in a variety of material, pieces of paper, small feathers, but mostly hay and moss. The hen disappeared inside but this time it would have been quite impossible to see what was going on, the box was so crammed with nesting material. I again left them quite alone. I particularly noticed that both birds took turns in the incubation which I would estimate to be about sixteen days. Both birds then started visiting the box very regularly. I supplied plenty of

live food but it was never touched ; large quantities of green food were eaten, particularly chickweed, and seeding grasses.

At the end of August one young one left the nest. It put one in mind of a young British Bullfinch. A second left the nest a few days later, but it appeared to be rather weakly and died after two or three days. The first is a fine, strong bird and is now quite as large as its parents.

As this species will be unfamiliar to the majority of our members it may not be out of place to give a brief description of it.

It is light chocolate-brown above ; blackish on the crown ; cheeks and ear-coverts white ; throat black ; breast light brown and separated from the white belly by a band of black ; tail blackish ; beak leaden. The sexes are alike in plumage, and the size is slightly less than that of a Java Sparrow.

As described above, A. Martin has bred the Brown Mannikin *Lonchura fuscata*. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

* * *

RAIN-BATHING

By C. J. O. HARRISON (Tooting, London, England)

One of the rewards of aviculture is the insight that it gives into the habits and behaviour of birds, much of which might rarely, or never, be seen in the wild. It was through watching captive and feral birds that I became aware of the occurrence of rain-bathing, about which little seems to have been recorded.

I was very impressed by the first view that I had of it, although it must be familiar to many people. It occurred in a flock of feral pigeons (*Columba livia*) which were resting on a dry day in summer when a sudden shower of rain fell. Instead of seeking shelter most of the birds squatted down and lay on one side with a wing extended vertically above them, the posture being apparently the same as that used in sunbathing. The birds appeared to be responding to a sensual stimulus by exposing to that stimulus a greater surface area of the body than would be affected were their posture normal. Since shelter was available, but not used, one may suspect that they derived satisfaction from this behaviour ; and since water was available, and since pigeons are capable of bathing in the typical fashion, the posture was not necessary in order for bathing to take place.

I was familiar with the typical bathing that most birds indulge in, with its squatting, head-ducking, and wing-fluttering ; and with the posture of a bird out of cover in heavy rain, moving with wings partly drooped and shaken a little at intervals to shed the accumulated water ; but I had not previously witnessed the use of a special posture for deliberate rain-bathing.

I have since seen this behaviour a number of times but, up till now, only from feral pigeons and not from other doves.

I next saw rain-bathing, in this sense of deliberate exposure of the body and plumage to rain, by a pair of Blue-winged Parrotlets (*Forpus passerinus*) in an outdoor aviary. Again, shelter that they were accustomed to use was nearby. As the rain began they called noisily and, bowing the head down low near the perch, they spread their wings horizontally to their full extent and, with tail spread, but a little lowered, moved clumsily about the perch in this posture for several minutes. On another occasion the cock took up this posture while clinging, head downwards, to the wire side of the aviary. In this position the vivid blue of wings and rump were fully displayed and he looked like some gorgeous butterfly.

I saw this posture again in a flock of Cockatiels (*Nymphicus hollandicus*) in an aviary at Whippsnade Zoo. After a prolonged dry summer my visit coincided with the first rain for weeks. As it started to rain there was the same outburst of noisy calling that I had heard in the case of the parrotlets, and bird after bird lowered its head and spread its wings and tail in the fashion already described, the white wing-patches suddenly flashing into view.

The only published description and photographs that I have discovered as yet are in Dr. Maurice Burton's book *Phoenix re-born*. He gives a photograph of an African Grey Parrot (*Psittacus erithacus*) in this posture, but from the movements of the head and partial spreading of the tail describes it as "anting without ants", although there is no evidence that a parrot will adopt such a posture when ants are present. He also quotes a description of a parrot adopting this posture ". . . when sprayed with warm water on the breast and wings". This bird, an Amazon, was described as having brought its wings forward until the tips of the first primaries were pressed together when fully displaying this posture.

I was uncertain whether parrots might not use this posture for sun-bathing, although I had never seen one do so. I discussed this with Mr. E. N. T. Vane who was able to tell me, from his very extensive knowledge of the parrots, that rain-bathing occurred widely among the parrots and that many species would hang head downwards when doing so. He confirmed my suspicion that sunbathing is seldom seen in parrots, which seem to spend more time avoiding direct sunlight ; but when he had seen it on various occasions from a number of species

it had occurred on the ground, the bird lying over to one side and extending only one wing at a time, fully spread, either to one side or up above the body.

From this it would appear that rain-bathing parrots use a special posture which differs from that used when sunbathing. Some species, such as the Budgerigar (*Melopsittacus undulatus*), which normally inhabit grassland, bathe by rolling in wet grass. As far as I know these species do not indulge in rain-bathing of the type described. The recognition of wet vegetation as a bathing medium appears to be innate. A friend had a Budgerigar which had been caged from its youth, but which was allowed to fly around in the house. He could not persuade it to bath in water but one day when some watercress was being washed the bird descended and proceeded to wallow in it, and subsequently behaved in the same fashion whenever green, leafy vegetables were washed.

From the evidence available so far it would appear that only pigeons and parrots possess these special rain-bathing postures. I find it hard to suggest a reason for this and I would not be surprised to find that the habit is more widespread but has passed unrecorded. If anyone has observed special rain-bathing habits in other families I would be most interested to hear of it.

REFERENCE

BURTON, M. (1959). *Phoenix re-born*. London.

Since I wrote these notes Mr. K. E. L. Simmons has kindly drawn my attention to a statement in *Bird Behaviour*, by Frank Finn, that "Larks . . . bathe in the rain, lying down in it with outspread wings, . . ."; which suggests that it might occur elsewhere among the passerines.

It is a pity that we do not know which species of Lark, in what country, and under what circumstances it occurred.

* * *

BREEDING OF THE YELLOW-WINGED SUGAR BIRD

(*Cyanerpes cyanerpes*)

By Dr. HENRY QUINQUE (Paris, France)

For some years I have always kept those wonderful birds, the nectar feeders, in my aviaries. Their metallic reflections, incomparable allure, and liveliness have always attracted me.

To begin with I kept a dozen Sunbirds together with a pair of Yellow-winged Sugar Birds in an aviary in my salon. Believing them to be extremely sensitive to cold, I overheated my flat for their benefit. This experience revealed a number of mistakes—the fights were incessant and often bloody; the resplendent red of some of the Sunbirds turned to a dull yellow after the first moult—in fact, I was keeping these birds under very bad conditions, which I afterwards changed completely.

In spite of the many mistakes I made to begin with it was in my salon in Paris in an aviary (measuring 1 m 80 in height, 1 m 50 wide, and 0 m 80 deep) containing twelve Sunbirds and a pair of Yellow-winged Sugar Birds that I had my first thrilling experience.

During the third week of May, 1956, the female Yellow-winged Sugar Bird began to be very interested in a laurel in a pot in the corner of the aviary. She examined the various branches minutely in search of the one which would be most suitable for her future activities. During this time the male was aggressive to all the Sunbirds which wished to perch in the laurel and did not hesitate to chase off birds much larger than itself. Some days later the female carried about blades of dried grass which she did not place in the shrub but rapidly dropped them. Then on 28th May, she really began the construction of a nest on the level part of the fork of a branch. On the following day I removed all the Sunbirds from the aviary in order to leave it entirely for the Yellow-winged Sugar Birds.

In spite of this disturbance the female did not stop the work she had started; for five days she carried pieces of ravelled-out hemp, cut into lengths of 8 or 10 cm., coconut fibres, and blades of green grass which had been provided for her. The result was a wonderful nest made in the shape of a cup, entirely lined with hemp with a few white feathers woven in. The cup measured 8 cm. in diameter inside, but was very deep and conical so when the female was on the nest she disappeared entirely from view except for her beak and tail which were raised obliquely upwards. The male took no part whatever in the building of the nest, but he followed the female about wherever she went. On several occasions he made the courtship display, but I did not observe

any copulation while the nest was being built. When the female had finished and shaped the nest by lateral movements of the body she laid two eggs. The eggs were laid on the 3rd and 4th June in the morning; they were globular, sky-blue in colour with tobacco brown spots, which were more dense at each end. For twenty days I refrained from going into the aviary to look at the nest, but when I did so I was most disappointed to find only one egg which was perforated at the side.

A few days after I had taken away the perforated egg the female laid two further eggs from which two perfect youngsters were hatched. Unfortunately the day after they were hatched I found them on the sand of the aviary. After having put them back three times, I had to pick them up again three times from the ground, where they had obviously been thrown out by the female. I realised that it was useless to persist as the male was frequently making the courtship display and the female evidently wished to lay again. I therefore took the tiny birds and put them in an artificial nest inside a heated box. I succeeded in feeding them with crushed drosophila and syrup by means of a pipette, but they died at the end of the third day.

Two weeks later I saw several matings and the female laid two more eggs. Two young birds hatched out, but their development was relatively slow though they were fed perfectly by the female for fifteen days when she suddenly stopped taking them any food, although I had taken the precaution of putting a large number of drosophila into the aviary which was entirely covered with fine meshed material.

Shortly after the death of these two young birds (which I have preserved in spirit) the female laid a single egg. This hatched into a magnificent young bird which developed rapidly, but was also abandoned on the fifteenth day when it was almost completely feathered. The summer over the male began to assume its eclipse plumage (the date of which varies considerably in each individual) and things remained as they were for this season.

After this year, 1956, full of hopes and disappointments, I moved all the birds which I kept in my flat to my large aviaries with heated shelters which are situated in the centre of France. In 1957, in spite of much more favourable conditions the same pair did not make a nest. In 1958 the male escaped from the aviary; the following year I procured a male, but the female died.

It was in 1960—thanks to a new pair which I bought at the beginning of the year—that I had the very great pleasure of success. I bought a female on the banks of the Seine on a very cold morning in January, though I made this acquisition without much hope of being able to save it, for I took home a ball of feathers chilled with cold and put it in a cage in my flat. By March it was a magnificent female and I took her to the country where a male resplendent in health and beauty was waiting for her. My aviaries are situated a few kilometers from Limoges

in the centre of France ; unfortunately the climate is continental, it rains a great deal and in winter the temperature oftens drops to 15° Centigrade. At the other extreme, the summers are very hot and interrupted by violent and frequent thunderstorms. For this reason I have had the shelters made with double walls with glass wool in between. These shelters are heated by thermostatically controlled electric radiators and open on to a wired flight, 10 m. long by 2 m. 50 wide and the same in height, for each compartment. I put the pair of Sugar Birds, in company with two pairs of Dufresne's Waxbill and eight Red-headed Parrot Finches, in one of these compartments which was planted with bushes in the outside flight.

At the beginning of May I again observed the courtship display of the Yellow-winged Sugar Birds ; the two birds perch side by side on the same branch, stand up stiffly to the fullest extent, throw back the head, holding the beak half open, and raise the tail vertically. They then both utter a stifled, sharp, trilling note which is more like the noise of a cricket than a song. I have often noticed the same attitude when a Yellow-winged Sugar Bird threatens another bird near it.

On 20th May, 1960, the female began to construct a nest in the shelter. Disregarding all the bushes planted in the outside flight and the boxes placed inside, she carried the material to the branches of bamboo placed inside the shelter. Whilst the nest constructed in Paris by the first pair was a work of art, this one was shapeless and careless, consisting only of a heap of dried grass scarcely hollowed out in the centre ; it was placed in full view on a few small branches of dried bamboo. After three days (23rd May) the female laid an egg followed by a second the next day. The eggs were identical in every way to the preceding ones, in number (never more than two), in the coloration of azure blue, and in size (being about one and a half times the size of the egg of a Gouldian Finch, but much more stubby and globular).

The two young hatched fourteen days after the laying of the first egg. One of them fell on the cement floor and was killed, but the second succeeded in remaining, for better or worse, in its uncomfortable nest. Like those which I had already had the opportunity of seeing, it had some downy feathers, blackish in colour, and very fine, especially on the head. A few days later the body was entirely covered in really black down, which is contrary to what I have read on the subject. The beak is as short as that of a seed-eater, but very wide at the base and very pointed at the tip and there is a bluish-grey membrane at the corners.

The food was brought by the female only and during the first eight days consisted entirely of soft insects caught in the outside flight. Later the female frequently fetched fruits and nectar from the bottles placed for this purpose. The female pushed her beak right down the throat of the youngster to feed it. The male always remained near the nest

during this operation, but never took part in feeding the young (nor, for that matter, did he feed the female while she was brooding).

How the young bird managed to remain on the pile of grass which served as a nest in spite of the incessant passing of the Red-headed Parrot Finches remains one of the many mysteries of nature. By the third week its beak was already half as long as that of its parents, the plumage was grey-green with some touches of yellow and the legs were completely black. At this time the bird left the nest for its first flight ; the parents took great care of it, always perching each side of it and accompanying it wherever it went. The female continued to feed it for a month and in begging for food it assumed the display posture of the adults shivering the wings like all young birds. After it left the nest the male never gave the youngster any food, but he guarded it and mercilessly chased away the Red-headed Parrot Finches if they came near.

A month after its first flight the young Yellow-winged Sugar Bird fed itself, took nectar from the feeding bottles, and caught insects in flight with the same agility as its parents. As I write these lines this magnificent bird is six months old ; it is completely tame and allows one to come within 50 cm. of it. Sometimes it threatens its father, which is in partial eclipse plumage, adopting the same attitude as the adults. The colour of its plumage is grass-green much brighter than that of the female ; the underpart of the wings is bright yellow, but the outer surface of the remiges is black which is an almost certain distinctive characteristic of the male of this species. A final point worthy of note is that the legs are black, whereas those of the female are rose-coloured and the male red.

I think this breeding success should be an encouragement to all those who like to keep nectar feeding birds or who hope one day to do so. Actually, these birds have a false reputation for fragility and extreme delicacy for, as a matter of fact, all they need is a little warmth in winter, absolute cleanliness, and the necessary food.

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PYRENNEAN BIRD LIFE

By M. ELLIS (London, England)

This is a short account of a visit in June, 1960, to the Pyrenees (French), the range of mountains separating the Iberian Peninsula from France.

The first day began with a fine view of a Black Kite (*Milvus migrans*) from the train travelling from Lourdes to Pierrefitte Nestalas. From here my two friends and myself set about walking to Gavarnie. On leaving the town the first birds to be seen were the familiar House Sparrows, Chaffinches, Greenfinches, Goldfinches, Blackbirds, Linnets, Skylarks, Corn Buntings, and a Spotted Flycatcher. A solitary Egyptian Vulture (*Neophron percnopterus*) flew over the road some distance ahead of us. Bullfinches, Blue Tits, Great Tits, Magpies, Jays, Carrion Crows, Sparrow Hawk, Green and Greater Spotted Woodpeckers were seen as we proceeded along the road. Often seen in the fast-flowing stream running parallel to the road was the Black-bellied Dipper (*Cinclus cinclus*), differing from the British bird, as its name implies, in the colour of its underparts which are black instead of chestnut.

Luz was the next town we passed through. Here the Red-backed Shrike was common, perching on a post, or in a low bush—one preening, was still wet from bathing. A number of the commoner passerines were to be found around the town, including Serins (*Serinus canarius*) and Chiffchaffs. Crag Martins (*Ptyonoprogne rupestris*) and Buzzards were now frequently to be seen along the road. High above a Golden Eagle and a Booted Eagle (*Hieraetus pennatus*) were soaring quite close to each other. The former were now to be seen at regular intervals high above the cliffs towering on either side of the road.

A large family of Grey Wagtails were amongst the birds inhabiting Gedre, the next town we passed through. The stretch of road leaving the town was rather dull and it was rapidly becoming dark. But we pressed on, and spent the night just outside Gavarnie.

We set off early the next morning and soon reached Gavarnie (4,500 feet). Lying at the foot of one of the most magnificent sights in Europe, the Cirque de Gavarnie. The town is very popular and visited by hundreds of tourists daily. A Peregrine Falcon was the only bird to be seen. Leaving the town, we soon saw Citril Finches (*Carduelis citrinella*), Serins, Yellowhammers, and Black Redstarts. Adding Tree Pipit, Mistle Thrush, and Jay, on the return journey. Soon we came upon what were to be our constant companions for the next few weeks, the Red-billed Chough (*Coracia pyrrhacorax*) and the Yellow-billed or Alpine Chough (*C. gracula*), as it is more commonly called. These wonderful birds were to be seen in mixed flocks performing their aerial displays and calling high above our heads;

higher up they were always to be seen feeding together on and around the snow. The White-throated form of the Black-eared Wheatear (*Oenanthe hispanica*) and the Alpine Accentor (*Prunella collaris*) were encountered before we stopped to eat at the beginning of the Gavarnie valley. While eating we had the good fortune to see a magnificent Griffon Vulture (*Gyps fulvus*) appear from the valley and circle with the fabulous Cirque in the background. The rest of the day was spent leisurely reaching the refuge in the centre of the valley, where we were going to stay.

Having had my sleep disturbed by the refuge's rodent occupants, I was up extra early the next morning, and at 6.20 a.m. one of my companions spotted a single Lammergeier or Bearded Vulture (*Gypaetus barbatus grandis*) circling high above the Port de Gavarnie (7,510 feet). An idea of its terrific size could be got by the way it dwarfed the Choughs, lower down, to pin-heads. Shortly afterwards it appeared again from a gap in the rock-face opposite the refuge. The combined effect of the early morning sun and the reflection off the snow displayed to great advantage its rich orange breast and underparts.

Later in the morning we made our way up towards the Port de Gavarnie; the air constantly being filled with the aerial call of the Water Pipit (*Anthus spinoletta*). We no longer met the Black Redstart, so often seen flitting from stone to stone on the floor of the valley, with a bill full of insects for its hungry family. We were unable to reach the Port but managed to climb to a higher position, looking across it, and into Spain. Seeing only a Kestrel after our hard climb, we became rather dejected and began to prepare our mid-day meal. Little did we know that we were about to reach the climax of our trip. For before we could begin, not one or two, but three Lammergeiers appeared below us heading for the Port. Led by an immature bird, having a white head, but lacking the white markings on the back and wings, which the adult that followed had. A little farther behind came a young bird almost completely a uniform blackish-brown, lacking the white head, and the same rhythm in its wing-beats as the two leading birds.

This magnificent bird, found in the high mountain ranges of Southern Europe, Africa, and Asia, has become known for its unusual habits. Amongst them the practice of flying to a great height with a large bone from a carcass, and dropping it on to the rocks below in an attempt to break it and obtain the marrow.

Before we could settle down again, over our heads and into Spain flew six Pallid Swifts (*Apus pallidus*), differing from the Common Swift which we saw later over Gavarnie, in being slightly larger and paler, and having a large white chin.

Other birds seen in the valley were Black-eared Wheatear, including

several youngsters, House Martin, Griffon Vulture, Snow Finch (*Montifringilla nivalis*) on two occasions, a young cock Rock Thrush (*Monticola saxatilis*), mainly greyish with the rufous just appearing on its breast. Adults were often heard, but never seen, although this youngster and others seen were quite tame.

The Heas Valley was visited. Amongst the birds not found higher up were a pair of Common Sandpipers, a pair of Rock Buntings (*Emberiza cia*), and a cock Blackcap. Taking insects to a nest in a hole under a overhanging rock about 10 feet up and beside the road was a Black Redstart. But a thick mist came down and blotted out further study in the valley.

Hobby, Goshawk, a family of White Wagtails, and a Stonechat were seen on the return journey to Lourdes.

* * *

DISINFECTION OF AVIARY SOILS

By J. G. SUTHARD (Long Beach, California, U.S.A.)

Until a recent visit by Mr. George A. Allen, Jr., Editor of the *Gazette*, I was not cognizant of the severity of the problem of soil disinfection in aviaries. We had tried various chemicals for soil disinfection and found the lime-sulfur method non-toxic and very effective. At Mr. Allen's request I wrote a short article on my experience with this method for the *Gazette*.

In this area we are confronted with infection from the common Sparrow (*Passer domesticus*), from snails, slugs, and earthworms which are hosts to numerous diseases. To combat infections of invertebrates, virus, and bacteria, one must resort to one of two methods: (1) Make the environment unsuitable for the pests or, (2) periodically treat the soil with chemicals. The problem in chemical treatment of the soil is that the chemicals which will destroy the wide range of pests are toxic to the birds. Too, any such chemicals used for disinfection must necessarily be short-lived otherwise their use would be dangerous to the birds. One alternative to the two general methods is heat sterilization of the soil. The use of a torch is hazardous and the use of a steam pan though effective is very cumbersome and expensive.

We have found that the lime-sulfur treatment of the soil as outlined below is both a disinfectant non-toxic to vertebrates, and a deterrant to micro-organisms, worms, snails, slugs, etc. The sulfur is also effective against all kinds of mites.

Lime-sulfur Method of Treatment

The application of the lime and sulfur is very simple. First, rake the aviary ground free of debris. Eight pounds of slaked lime¹ and

¹ Slaked lime, $\text{Ca}(\text{OH})_2$ —this hydrated calcium oxide is available in a fine powder from builders' supply houses.

four pounds of sulfur¹ are applied per hundred square feet. This should be spread as evenly as possible and the soil turned by spading. The area is made level by raking and two pounds of lime and two pounds of sulfur used as top dressing. This should be raked into the surface. The birds may be returned to the pen immediately. In the case of very tame birds the operation may be performed without removing them.

The above treatment of the soil should be adequate for six months. Periodically lime may be dusted under the roosts and around the water-pans or drippers to keep the soil from becoming sour. The sulfur is slowly oxidized to sulfur dioxide which is a powerful disinfectant and, in its elemental form, is a killer of mites of all kinds. We believe it is complete protection against leg mites.

In badly-infected soils unslaked or dehydrated lime² may be used as a heating agent as well as a disinfectant. To apply, trench the aviary with furrows about 6 inches deep and 12 inches apart. Place in these furrows unslaked lime (use gloves to handle), broken up into chunks about 2 inches in diameter. Fill the trenches with soil to cover the lime and soak the whole area with water. The heat generated by the hydration of the lime will kill all forms of life in the soil. The birds should not be returned to the aviary until it has completely cooled.

Where the onset of an infection is rapid and severe the use of strong chemical disinfectants may be necessary, so their use and the precautions therefor are discussed here in some detail.

Sodium Hypochlorite (Bleach)

Sodium hypochlorite is used generally in the form of 5 per cent aqueous solution for household purposes. It is available as a 30 per cent solution which is a strong oxidizing agent and should be diluted to about 10 per cent solution with water before use.

To apply, spray the soil, posts, baseboards, and perches until thoroughly wet. The birds should be removed from the pen before spraying. Spade the soil and spray again with the sodium hypochlorite solution and allow to stand for twenty-four hours.

Hydrogen Peroxide

This is an expensive chemical available in 3 per cent aqueous solution or as a 30 per cent solution. The latter should be diluted *carefully* (it will explode otherwise) by pouring the peroxide into water to

¹ Sulfur—any finely divided sulfur may be used, but the so-called "soil sulfur" is the least expensive. It is commonly used in agriculture to supply sulfur to soils deficient in this element.

² Unslaked lime, CaO—unslaked or dehydrated lime is available in chunks as taken from the kilns. It has a great affinity for water and this hydration generates heat. Gloves should be used in handling to prevent burning of the skin.

make a 5 per cent solution. The aviary, if small, can be thoroughly disinfected by spraying the ground, posts, wire, baseboards, and perches with the solution. As the oxygen is dissipated rapidly the birds can be returned shortly after the spraying is finished.

Chloride of Lime

This potent chemical can be used to disinfect the soil but has the disadvantage that soil will have to be allowed to stand for several days before re-use. The active agent, chlorine, is liberated slowly even when the soil is wet. The chlorine gas, being heavy, must be diluted by exposure to the air for a time.

Halogen Compounds (Compounds containing Chlorine, Bromine, or Iodine)

Most of the halogen compounds are too toxic to be useful for soil disinfection in aviaries. The use of a solution of potassium iodide—iodine solution—has been sold for this purpose but as the iodine sublimes at atmospheric temperatures, it presents a terrific corrosion problem with any metal surface such as the wire, etc. It is a powerful bactericide, but in addition to its corrosivity, is rather expensive to use.

The use of antibiotic dust could be justified in small enclosures, but again is very expensive.

The lime-sulfur treatment of the soil is the least expensive, least toxic, and most effective of any chemical treatment I have tried. Unfortunately the one type of infection which is difficult to guard against is virus. The most common is fowl pox which appears to be airborne, but resides in the soil for long periods. The use of lime appears to be effective in the destruction of this virus in the soil, particularly if the soil is kept moist. It is believed that the effective action of the lime is due to its alkalinity.

The lime sulfur method is consistent with some of the older methods such as wood ashes of which the effective agent was sodium or potassium carbonates and hydroxides.

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DISPLAY FROM A CAPTIVE COCK-OF-THE-ROCK

By C. J. O. HARRISON (Tooting, London, England)

Since 1955 the Small Bird House at the London Zoo has housed an Orange Cock-of-the-Rock (*Rupicola rupicola*). This lovely bird is almost wholly orange, even to the intense orange iris of its eye and although the flight feathers of the wings are black they are mostly concealed by elongated, tapering, wispy fringes that spread outwards from the edges of the feathers on the back, rump, upper tail-coverts, and secondaries.

I had seen this bird, a solitary cock, a number of times, but always crouching on the floor of its aviary enclosure in what appeared to be a semi-moribund condition. I had assumed it was ill and was puzzled that its condition seemed unchanged over a long period, but it was not until I recently visited the house on a day when few visitors were present and saw the bird perched in a normal posture, only to fly down and crouch as soon as it saw me, that I realised that it was almost constantly performing a display of some kind, directed at passers-by.

Very little is known of the behaviour and displays of these birds and I have only found one short first-hand account of their display in an article by W. Frost, in the AVICULTURAL MAGAZINE for 1910, where he describes their behaviour in their natural haunts. The chance to observe such behaviour is one of those unique opportunities that occur in aviculture and the information is worth recording.

In the presence of a human being, seemingly of any age or sex, the bird appears to pass into a trance-like state. This reaction is so instantaneous and so consistent that it is difficult to see the bird in its normal state, unless one can take it by surprise.

The bird's emotional state is most apparent from the appearance of the crest. Fig. 1 shows the crest in its normal, relaxed position. It arises on either side of the head in the region between the base of the bill and the eye, and spreads out to form a flat double fan of feathers which widens as it terminates on the crown of the head. The crest is orange, with a narrow, chestnut subterminal band bordering it.

When the bird begins to respond to a person's presence the crest is slowly expanded forwards and downwards, passing down on either side of the bill until it reaches the feathers of the throat. At the same time the head is tilted back a little and the large eyes gradually close to mere slits.

This expanding of the crest and closing of the eyes appear to be intimately linked. On one occasion I had the excited bird clinging to the wire in front of my head, facing me, with crest closed and eyes open. As I watched the crest began to expand and at the same moment



Fig. 1.

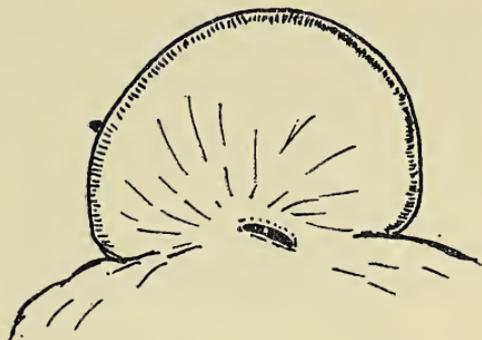


Fig. 2.

the eyelids began to close. This action was not complete, when the eyes began to open again and the crest began to contract. This was repeated several times, appearing to coincide with the onset and waning of impulses of excitement in the bird and I was able to witness the repeated incomplete spreading of the crest accompanied by partial closing of the eyes, the two movements occurring as though there were some mechanical link between them. In view of the position of the crest in relation to the eye it seems possible that some muscular relationship might exist. Fig. 2 shows a lateral view of the head with the crest erected, the head lowered onto the shoulders with bill tilted upwards and the eyes almost closed. This is the position adopted during display and although I have indicated the position of the tip of the bill, half-way up on the left-hand side of the crest, in life it is invisible to the casual eye.

The bird may begin to show this posture when perched, but invariably flies down to settle on the ground by the wire front of the enclosure, near the observer. The head is drawn down on the shoulders and the feathers of the neck and breast are fluffed out so that body and head appear to be a single rounded mass, the only break in the outline being the flat expanded crest which stands up above the body (Fig. 3). The wings and tail are hidden by the mass of feather fringes which sweep down like a trailing skirt at the back.

It crouches sideways on to the observer in a position which might be due to the physical arrangement of its surroundings, but which appears to be a deliberate lateral display. The head is always turned away so that the posterior edge of the crest is presented towards the observer. The crest is now fully spread and the eyes closed to mere slits. This posture is shown in Fig. 4. There sometimes appears to be a slight inflation of the neck and breast feathers, but otherwise the bird is motionless and appears to be in a trance-like state. Prodding from an inquisitive finger produces no reaction, but the bird is conscious and watching. If the fingers of the hand are inserted through the wire and

pushed further and further forward in front of the bird, the head is turned further and further away, so that the posterior edge of the crest is always towards the foremost part of the fingers.



Fig. 3.

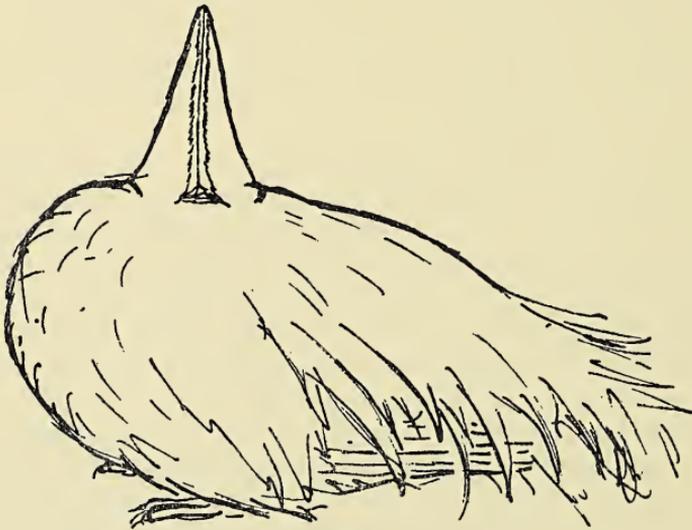


Fig. 4.

Although the bird normally crouches it may slowly rear itself up while maintaining the display posture. This might be due to the height and position of the observer and be an attempt by the bird to align itself in relationship to him.

In this crouching posture the bird's appearance does not suggest that of any normal creature. All that can be seen is a mass of fluffed orange feathers, from one end of which rises a flattened crest at right-angles to the main axis of the body. On the inner side of the crest, at its base, is the narrow slit of an eye, and there is another in a similar position on the outer side of it. There is no sign of a bill. One may frequently see baffled visitors trying to discover a recognisable avian structure within this mound of feathers. Normally the bird remains silent, but I heard an occasional faint cluck from it while it is posturing.



Fig. 5.

The bird may relax its posture, but when doing so maintains a crouching posture, the top of the crest no higher than the back and still expanded, and the eyes almost closed, as in Fig. 5. In this posture it may perform exaggerated hops, springing one or two feet vertically into the air and landing still crouching. If one moves to a new position in front of the cage the bird quickly relaxes its posture and flies to settle in front again. When doing so it may utter a loud squawking call and may fly directly at the head of the observer, clinging to the wire in front of him. There is a suggestion of aggressiveness in this behaviour.

Through the kindness of John Yealland, the Curator of Birds, I was able to visit the door at the rear of the cage through which it can be entered. I had hoped to see if the bird would react frontally to a person if no barrier was present. I found, however, that the bird did not react to the presence of a person at the door or inside the cage, but still persisted in flying down to posture at the front of the cage.

The keeper informed me that it postured to him in the same manner and was erratic in its behaviour, sometimes showing great tameness and permitting handling, and at other times flying at him in the apparently aggressive manner that I had observed when watching from the front of the cage.

The bird had been purchased from a native in South America in 1955. A surprising variety of birds and animals are reared by some native tribes and I suspect that this bird had been hand-reared and had acquired a total fixation on human beings. This view is reinforced

by the knowledge that the cock had been put with a hen at an earlier period, but had ignored her and continued to posture to passers-by.

So little is known that it is impossible to be sure whether the behaviour described represents an aspect of the elaborate communal display of this species, or whether it represents a response to another individual which under natural conditions might be a rival or a mate. There are elements of both aggressive and submissive responses in the behaviour described.

Frost, in the article which I have already mentioned, described a communal display in which one cock after another in rapid succession would fly down from a branch to settle on the ground and immediately turn and fly back to the perch, the whole forming a single rapid movement. The ground at such a spot was swept bare by the wings and tails of the displaying birds and the same spot was used repeatedly on different days.

The apparent attachment to one part of the cage shown by the captive cock and the fact that his behaviour resulted in this area being swept clear of sand, might be related to the behaviour described, but could be purely accidental.

If this behaviour is linked with the type of display-dance described by Frost, then we have a combination of the erection of specialised head-feathers and a display dance, or flight, between two points which is very reminiscent of the displays described for the Mannakins (Pipridae).

REFERENCE

FROST, W. The Cock of the Rock. *Avicult. Mag.*, Ser. 3, Vol. 1 (1909-10), pp. 319-324.

* * *

CAGE AND AVIARY DESIGN

By JEAN DELACOUR (Director (retired) Department of History, Science, and Arts of the Los Angeles County, U.S.A.)

There has recently been a frightening outburst of bad taste in zoo designing ; fantastically shaped and coloured houses, cages, and aviaries have been erected here and there. Even worse ones are being planned. I was saddened recently at seeing the ugly and inadequate gibbon cage now being built at the London Zoo (on whose Council I served for many years) and still more so by the project of an aviary—a fussy, ridiculously shaped, “horned” horror which is not only in bad taste, but impracticable and unsuitable. The principle of a “walk-in” cage is excellent, and I can claim to be the sponsor of such aviaries in America, where they have proved highly satisfactory. But its very principle is that the cage itself is not obvious, so that the visitor who is inside has as much as possible the illusion of walking among free birds. The frame of the aviary must not only be simple and inconspicuous, but also made invisible by trees and creepers. Even its approach should be so planted on the outside that one is not aware that there is a cage at all.

As to colours, it might be appropriate to reproduce here a note I was recently asked to write for the *Journal of the American Institute of Park Executives* (Parks and Receptions, January, 1961, p. 19) :—

“In museums and zoos alike the use of bright colours should be made with extreme caution. A cardinal principle must never be forgotten : the exhibit itself, dead or alive, is the only object which should call the public’s attention. Therefore, any flashy colours on the frame, container, cage, or fence are to be avoided. Those fixtures should be ignored or forgotten, and only discreet tones, which harmonize well with the neighbouring media, are adequate. All kinds of light fences and wire nettings are better painted black, a colour which makes them almost invisible.

Exceptions can be made only in the case of special installations, where an amusing and bright note is in order ; particularly in children’s zoos, and in facilities such as restaurants, souvenir shops, stands, etc. There everyone’s personal taste has a free range. It is essential, however, that brightly coloured facilities be screened from the main animal exhibits and do not compete with them. I favour, personally, some restraint in any case. In museums and zoos we do not try to sell common merchandise. Flashy colour schemes, which work well in purely commercial premises are out of place in such institutions. We show natural objects which have themselves a great attraction—they do not require outside help to call the visitor’s attention.”

NOTES FROM THE ORNAMENTAL PHEASANT TRUST

By PHILIP WAYRE

Birds in the Trust's collection have started the breeding season well. At the time of writing eggs have been laid by many of the rarer species of pheasants, including Temminck's Tragopan, Common Koklass, Himalayan Monal, Elliot's and Mikado. The Common Koklass laid seven eggs in her first clutch. This species has not been successfully bred in this country before, although Mr. F. E. B. Johnson succeeded in hatching chicks from his pair last year. Both the Trust's Cabot's Tragopan hens have laid, although unfortunately one bird had lost its mate a few days earlier.

Ten new permanent breeding pens, each measuring 20 by 9 yards, have been completed recently. Each pen contains a wooden house, purchased by the Director from the Leckford Pheasantries and presented to the Trust.

Recent arrivals include some Rock Partridge (*Alectoris graeca*) eggs from Cyprus, a pair of Painted Spurfowl (*Galloperdix lunulata*), and a number of Quail given to the Trust by Mr. R. D. Sane, one of our members in Bombay; a pair of Grey or Red-necked Francolin (*Pternistis afer swynnertoni*) has been presented by Mr. Guthrie Hall, Penalonga Pheasantries, Southern Rhodesia.

On Saturday, 15th April, the Director gave the première of his film *Wind in the Reeds*, which is about the wildlife of the Norfolk Broads, at the Royal Festival Hall in aid of the Imperial Cancer Research Fund. An audience of nearly 3,000 resulted in several hundred pounds being raised for the Cancer Fund. A copy of the Ornamental Pheasant Trust's pamphlet was enclosed with every programme, and at the end of the show the Director explained the aims of the Trust and invited membership. Already a number of new members have joined.

Many visitors have been to see the collection this spring, and members are reminded that they are always welcome, but are requested to write or telephone beforehand. Arrangements will then be made to show them round.

* * *

OBITUARY

MONSIEUR A. DECOUX

One of the doyens of European aviculture, Monsieur Aimé Decoux, died in October, 1960, at the age of 72 at his country home Géry, at Aix-sur Vienne, near Limoges, France. Poor health and certain financial difficulties had compelled him to reduce his collection of live birds during the last two years, but until then he had kept some of the best series of parrakeets, doves, and small birds ever assembled. He had numerous aviaries and several bird rooms and many species were raised in them during the last fifty years. He kept rare birds of all kinds.

Monsieur Decoux was a scholar and wrote well in French, English, and German. The AVICULTURAL MAGAZINE as well as French and German journals contained many excellent studies of his birds. A long and close friendship was formed between him and the writer and he was also a friend of our late Presidents, H. D. Astley and A. Ezra. We all exchanged pleasant visits, enjoying one another's birds and exchanging observations.

The passing of A. Decoux is a great loss to aviculture.

J. DELACOUR.

* * *

LONDON ZOO NOTES

By J. J. YEALLAND

Two specimens of the Kori Bustard (*Choriotis kori struthiunculus*) have been presented by Mr. J. O. D'eath who found them at a game farm in Tanganyika where they had been reared. This northern race had never before been in the collection and it is many years since the southern one, the Gom Paauw, as it is known in its native South Africa, was here. The males are said to weigh between 20 and 30 lb. and females only about 11 lb. It is a bird of the dry, open country feeding on small reptiles, various invertebrate life, especially locusts, vegetable matter such as seeds, and, it is said, small mammals. These two birds certainly like mice better than anything else.

Other arrivals of particular interest are an Imperial Parrot (*Amazona imperialis*), only found in the mountain forests of Dominica and now very rare, and a Blue-eyed Cockatoo (*Kakatoe galerita ophthalmica*) of New Britain and New Ireland.

A Red-legged Gannet (Red-footed Booby) chick was brought from the Cocos Islands and has grown well, being now able to fly. Two Humboldt's Penguins, four Golden Plovers, and a White-winged Parrakeet have also been received.

Two Yellow-backed Sunbirds (presented by Messrs. G. H. and J. R. Newmark and Mr. T. Dineen) have been released into the Tropical House. In this house there is a Pucheran's Emerald Humming Bird that was received in April, 1957.

Three Great Eagle-Owls and two Spotted Eagle-Owls have been bred in the Gardens. Spectacled Owls and Wood Owls nested, but the single egg in each case was not fertile, so eggs of Snowy Owl have been substituted for them. Last year the Wood Owls hatched and reared a Snowy Owl which, of course, soon became larger than its foster parents.

* * *

NEWS AND VIEWS

The breeding pair of Ospreys has returned to a nesting-tree at Loch Garten, Inverness-shire. The male arrived during the morning of 8th April, and the female the evening of the following day.

* * *

A recent count of wild Takahes indicates that this very rare bird is on the increase. Forty birds have been counted against twenty-six at the previous survey. It would certainly appear that the efforts of the Wildlife Division are proving successful.

* * *

Paul Schneider writes that it is his ambition to obtain a pair of Splendids. He says: "At present there are no breeding pairs in the United States. Bourkes and Elegants are quite plentiful and it is not uncommon to see flocks of twelve to twenty-five in various aviaries throughout Southern California."

* * *

An overseas member, with happy memories of a President's Garden Party at Foxwarren Park, enquires regarding the present ownership of our late President's former home. The property was purchased by Sapphire Films, Ltd., and it was in the grounds that the scenes for one of television's most successful juvenile series "Robin Hood" were shot. The film company has now gone into liquidation and Foxwarren Park is at present in the market.

* * *

Lloyd B. Thompson writes: "Mrs. J. Davidson who lives near here (North Burnaby, B.C.) last year reared two Roseate \times Sulphur-crested Cockatoo hybrids. During the past three years she has reared nine or ten of this cross. When they leave the nest the young are grey with some yellow around the breast and neck and they have an amber crest. With each moult the body and wings become whiter. One young cock, a year and a half old, is about 50 per cent white on his back which is nicely marbled with grey and white."

* * *

The Wildlife Division of the Department of Internal Affairs has

succeeded in trapping four Kakapos in the Tutoko Valley, Fiordland National Park, South Island, New Zealand. The Minister of Internal Affairs, Mr. Gotz, has taken great personal interest in the project, which has been under the supervision of the Controller of Wildlife, Mr. J. D. Pascoe, with Mr. M. M. Small in charge of the search operations.

Every effort will be made to breed with these birds, which are in extreme danger of extinction. They are being maintained at the Mount Bruce Farm, Wairarapa, where Mr. Blwyn Welch has so successfully cared for the four captive Takahes. The Kakapo enclosure, which is both vermin and escape proof, is about 31 feet by 15 feet, and is divided into two so that the two pairs can be housed separately. In each enclosure two substantial underground rock caves, 2 feet by 1 foot 6 inches in height, have been made to simulate the holes under boulders where Kakapos spend the day in their natural habitat. At first there was some concern because the birds had reacted against the unavoidable handling, but they eventually settled down and are now eating apples, tomatoes, oats, bracken fern, and drinking honey in water.

We have just heard that one of the captive birds has died, but a fifth has been caught and they all seem to be doing well.

* * *

Charles Everitt sends a little advance news of the Edward Marshall Boehm aviaries. He writes: "Despite the late coming of spring, it is still very chilly and windy out here, we have started our breedings for 1961. The Wood Swallows have got two chicks, five weeks earlier than last year, and a Black-headed Sugarbird is on two eggs. We had another pair of Hoopoes go to nest, but, as with the pair last year, the hen died after having laid her third egg. This leaves us with but a solitary male so, until we get some more, we can go no further with those. I think we shall pull off some interesting ones this season, but it is too early yet to make any conjectures on the subject. Anyway, we have learned some rather useful things from our last year breedings. The yellow ring round the eye of the Magpie Tanager shows up at 8½ months old: Also they are sexable by the size of the white spots on the wings and the fact that the tail of the male is longer and broader than that of the female—rather a fine difference to pick out in an individual bird unless one has actually seen the variation. We have also detected a distinct sex indicator in the Occipital Blue Pies. The females have an iris of golden-yellow whereas that of the male is golden-brown. Further, the thighs of the female are greyer than the male's and the tail-feathers are not so long or as broad. These last two features would be hard to use as a guide, but the iris of the eye is a sure guide. I have not seen this recorded anywhere, so I thought it might be of interest."

A. A. P.

REVIEW

CAGE BIRDS. By R. M. LOCKLEY. Pan Books, Ltd. London, 1961.
Price 2s. 6d.

This book sets out to give the would-be bird-keeper comprehensive information as to how to go about his chosen hobby. There is a general introduction to the subject, followed by chapters on Canaries and Budgerigars and others in which all those species of foreign and British birds that the author considers most suitable for cage or aviary are briefly described, together with instructions as to their care in confinement. It is illustrated with numerous sketches of varying quality and four plates of photographs. One of these is titled "Chaffinch Mule" but appears to be a normal hen Chaffinch without the least sign of hybrid ancestry.

The book is, like the Curate's egg, quite good in parts.

The author makes some statements that are misleading and others that are entirely incorrect. For example; that mealworms and gentles are an adequate alternative for wild insects (they certainly are not for most birds that feed their young on live food). That doves do not bathe in water but do bathe in dust (the reverse is true) and that their crop-milk is "semi-digested pap" (it isn't). That the nest-building of male weavers is "an occupational disease" and is comparable to the waltzing of waltzing mice (it is perfectly normal innate behaviour in no way comparable to the pathological waltzing of mice). We are told that bread and milk with beaten egg will serve as a substitute for insects for waxbills that are rearing young but not *how* to induce the waxbills to eat this substitute. It is not difficult to devise diets that are theoretically suitable for any particular bird, getting the bird to co-operate is a different matter and one all too often, as here, conveniently ignored by writers on bird feeding.

When it comes to general principles, however, the author's being primarily a student of birds in the wild state has its advantages. His advice on giving birds as much room as possible, allowing them to bathe when they like, giving parrots plenty of company (human if they are kept as house pets), and emphasising the dangers that may result from ringing nestlings are sound and humane and should do much to help beginners who read this book. Inevitably, however, the impression is given that bird keeping is rather easier than it usually is, at least so far as the keeping and breeding of most wild birds is concerned.

Printers' devils have had a field day with the spelling, or rather mis-spelling, of scientific names and on the vexed question of the relationships of the finches, weavers, and estrildines the author appears to disagree with most modern students of these groups. But these are minor points and, from the point of view of the aviculturist, there is

at least something to be said for considering all small seed-shelling birds as "finches".

The author acknowledges the help he has received from the secretary of the Royal Society for the Protection of Birds and points out that he is on the Council of that body. Perhaps, therefore, this indicates that some leading bird protectionists now realise that it is as justifiable for persons of modest means to keep and study such birds as they can adequately care for as it is for some R.S.P.B. members to keep wild waterfowl. If such is the case the publication of this book is to be welcomed by all aviculturists, indeed by all fair-minded people, for more than its intrinsic merits.

D. G.

* * *

CORRESPONDENCE

TAWNY OWLS TAKING PARTRIDGES

I was surprised that no advice was offered in response to Mr. J. E. Harris's letter published in the January-February issue, but perhaps we all expected someone else to do it.

If Tawny Owls are killing the Partridges, the grass should be allowed to grow long and *Cotoneaster horizontalis* should be planted, thereby giving more cover. The ripe berries of *Cotoneaster horizontalis* are a favourite food of many birds.

ZOOLOGICAL SOCIETY OF LONDON,
REGENT'S PARK, LONDON, N.W. 1.

J. J. YEALLAND.

SHOW CAGES OF BRITISH BIRDS AT THE NATIONAL SHOW

Perhaps you might be interested in publishing in the correspondence pages of the AVICULTURAL MAGAZINE the following comments on British Birds' Show Cages.

I would like to go on record as completely endorsing the sentiments expressed by Mr. Derek Goodwin in the March/April number with regard to the British Hardbill Show Cages.

As mentioned by Mr. Gregg in his letter these cage sizes are standardized by the British Bird and Mule Club and I think I express the feelings of a very large number of aviculturists when I say that it is high time that the above-mentioned Society altered its rules and permitted British birds to be shown in a proper sized cage. Mr. Gregg in his letter states that he thinks the cage sizes are quite right and he is, of course, fully entitled to his opinions but if he has ever looked at the British section in a show objectively, and as a whole, he will find that of all the sections this is the dullest and dreariest part of what should be one of the most attractive sections of a show.

In my opinion his argument that there is the risk of a bird damaging itself in a larger cage is entirely without foundation as foreign birds do not dash about and damage themselves in much larger cages and neither would properly trained British birds.

Another thing which affects the appearance of this section is the dreary colouring which, although presumably supposed to enhance the colour of the plumage of the birds, in actual fact just makes that section look very dull.

Anybody who has been to the average Club Bird Show, or has had anything to do with running a show, knows very well that in the average hall, all lighting is overhead and by the time that dusk has fallen which is, of course, very early in the show season, if one wishes to look at a British bird at all it is necessary to lift the cage out and tilt it in order to examine the exhibit.

I submit that this is ridiculous and, as one does not have to do it in the case of a Budgerigar, a Canary, or a foreign bird, why should it be necessary to show British birds in such dull coloured cages when it must be well-known that the lighting in the evening would be insufficient to show the birds up properly.

Also there is a very great deal of truth in Mr. Derek Goodwin's remarks about the serious damage that showing birds in these small cages does to the British Bird Fancy. In my experience a very large number of the ordinary visitors to shows are put off by the unattractive showing of birds with which they are familiar. Indeed one is often reduced to the level of having to give as much defence as one can possibly think up to justify this method of showing. Mr. Gregg states that at the National Show there is a special place where the casual visitor can find out the details as to how and why birds are to be shown, but how many casual visitors at any show do so?

I may say that I have kept and exhibited a fair number of British birds at local and open shows and have also done a certain amount of judging, so I cannot be accused, as Mr. Gregg hints, of being a "starry-eyed innocent" and I respectfully suggest that the British show cage, which, in my opinion at any rate, is a relic of the bad old days when bird shows were held in the back rooms of dubious public houses, should be done away with.

Let us show our birds under proper, clean, and attractive conditions and in cages in which the ordinary visitor to a show can see that the birds have room to turn round and not in the tiny boxes which are now used.

"BRACKEN,"

CORNSLAND,

BRENTWOOD,

ESSEX.

H. MURRAY.

The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

* * *

The death of Mr. E. N. T. Vane, on May 30th 1961, is announced with great regret. An obituary notice will appear in the next number of the Magazine.

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R. P. Bufton	10	0	0
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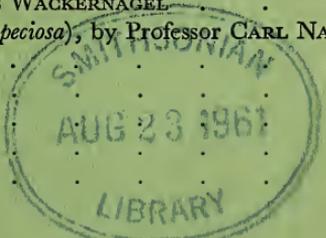
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AVICULTURAL MAGAZINE



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Founded 1894

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THE AVICULTURAL MAGAZINE

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BLUE-THROATED BARBET.

AVICULTURAL MAGAZINE

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JULY-AUGUST, 1961

THE BLUE-THROATED BARBET

Cyanops asiatica (Latham)

By D. M. REID-HENRY (Woodford Green, Essex, England)

In the oriental regions of the world there are a large number of wild fruit trees, which are very prolific in their yield. To the western mind it is somewhat of a mystery how such multitudes of human beings manage to starve, or to live in a state of semi-starvation, in the midst of such reputed plenty. In many cases the answer to this paradox lies in the fact that some degree of effort is required to harvest and store this bounty.

The birds do not starve ; neither do they as a general rule lay up any treasure upon earth. Moreover, they are frequently very wasteful as is shown by the quantities of berries which are sampled and cast to the ground with no more than a single bite taken. But then, perhaps this is just their way of passing on some of the good things of life to those below, who, less fortunate than themselves, are unable to climb the trees, and are only too willing to partake of the fruit thus provided. Mankind pontificates at great length upon subjects such as this, as to whether there is any intelligence in a bird capable of providing for the desires of others. I do not know.

It is a sight (worth the crick in the neck which one will certainly get !) to see, or rather to try to see, the number of birds of widely differing species which will gather in the vast canopy of a fruiting ban-yan tree. There will be many more than you do see, and of these several will betray their presence by sound or movement. Half-eaten berries will fall, and following the general line of descent back to the imagined point of origin one may learn of the presence of a bird. It may be that noisy horror of the first dawn-light—the Koel, which is a kind of cuckoo. It may be a clumsily clambering parrakeet or a green fruit pigeon. It may be a barbet.

Barbets are common birds as a rule. There are species which prefer

the hot and dry plains and there are those which are only met in jungle country of a hilly or mountainous nature. It is said that they do not come to ground and are entirely arboreal. This may well be the case for they are not suited to life on *terra firma*. Their feet are zygodactyl (two toes forward and two backward) and are strong for grasping a perch or for clinging to the bark of a tree like a woodpecker, but they do not climb. Like the latter, they excavate a hole in the wood of a tree and make such nest as they require at the end of the tunnel where there is an enlarged nest-chamber. Frequently the neatly rounded entrance hole is made upon the underside of a branch, but whether this is a piece of avian drollery allied to exhibitionism or whether it is a ruse to defeat the attentions of would-be predators is not known. The bills of barbets are heavy and powerful, and are surrounded by an outcrop of long and tapering bristles. The size of the bill varies considerably in individuals of the same species, and even from one season to another in the same bird ! I have noticed this is also the case in kingfishers, woodpeckers, and several other birds which I have kept from time to time. Doubtless this is due to the heavy usage which the bills of these birds are called to withstand ; and I feel that measurements of bills of birds which put them to hard work are of small use in connection with systematics and the separation of one subspecies from another.

The food of nearly all barbets is fruit, with strong preference shown for the various wild figs. Some species such as the Crimson-breasted Barbet (*Xantholæma hæmacephala*) may be said for all practical purposes to be entirely frugivorous, whilst others, including the Blue-throated Barbet, are ready to eat a more varied diet, including small lizards, beetles, and other insects.

Generally speaking, the smaller the bird the more closely it sticks to a fruit diet, but this does not apply to the African species of which there are very many. These latter make inroads on the termite population to a much greater degree than do the Asiatic birds, and in some cases insects are the main item of food.

We come now to a point about which very much has been written both in serious ornithological literature and in the more pregnant style of soldiers' letters home. Nobody who ever had anything to do with the tropics has failed to note and to comment upon the voices of barbets ! As an indirect result of listening to their songs strong men of sound mental balance have been reduced to a state of incoherent and imbecile rage, whilst others have received medical treatment for nervous disorders. Unlike the drooling noises with which we are more and more assailed from the loudspeakers of our (and our neighbours') radios, we cannot obtain rest by merely switching off ! For the voices of barbets are tireless and must, in the nature of the bird, be used. As fast as one can be silenced, others take up the monotonous strain.

One would not mind except for the fact that it is mostly at that hour when the heat of the afternoon is most intense and the habit of humans is to retire for siesta, that the noise begins. The only escape I can sincerely recommend is to learn to like it, but I will not offer advice as to how this is to be done ; it is a matter for philosophy, and for temperament.

The bird which is figured in the coloured plate is an inhabitant of the trees growing upon the slopes of the Himalayan foothills from the Punjab to Burma. Further east other races take its place. These may be recognized by the encroachment of blue into the forehead and crown. In one race the red is entirely replaced by blue.

This is one of the most frequently imported barbets, at any rate into Britain, and is one which does well in a roomy cage, and fed upon fruit and a reliable insectivorous mixture. Mealworms are appreciated, and clean water a constant requirement. It often comes over in a somewhat bedraggled condition, but the plumage will improve considerably after a few sprayings with rainwater, and the chance to preen in clean surroundings.

In size it is slightly larger than a Blackbird (*Turdus merula*) but there is a good deal of variation between individuals.

If housed in an aviary, care should be taken not to include weaker birds with them because they are frequently very spiteful and broken legs or worse will be the result, as I discovered when I first obtained one of these barbets many years ago in Calcutta. It wrought considerable damage to several small birds in the aviary before I discovered who was the culprit. I did not ever see it deliberately chasing birds because it knew well that they were more nimble on the wing than it could be itself ; but it would sit quietly amongst the foliage and execute swift punishment upon any bulbul which chanced to alight within reach of its large bill.

In the same aviary I had a pair of Coppersmiths or Crimson-breasted Barbets which came into my hands one day. The two species, despite the great disparity in size did not interfere with each other, but I soon found that the Coppersmiths had to be moved because they would partake too liberally of the "suttoo" which was provided as a general item for birds such as bulbuls, thrushes, pittas, Rosy Pastors, orioles, etc.

Suttoo is a powder, ground I believe from lentils, which is mixed with water into a paste and can then be given the birds in lump form, or rolled between the fingers into pills which can be swallowed whole, and thus obviate the need for the bird to dig into the mess. Without doubt it is a useful food, particularly for hand-rearing young birds. It is very rich in protein, and for this reason it soon kills the Coppersmith, who will cheerfully indulge itself to excess and thereby execute its own death warrant.

The matter of food for barbets brings my mind to the interesting story told by Mr. Salim Ali, that well-known author of books on Indian birds. He says that barbets are much disliked by coffee planters in India because, "The birds swallow large quantities of the ripe 'cherries' and disperse the seeds ('berries') far and wide. As these are voided individually and not in bunches (as by monkeys and jackals) it is not possible or worthwhile to collect them and they just mean so much loss to the grower".

* * *

BREEDING THE BLACK-FACED CANARY IN CAPTIVITY

(*Serinus capistratus capistratus*)

By B. P. DORMER (Luanshya, N. Rhodesia)

(I have received from Mr. B. P. Dormer, an aviculturist in Northern Rhodesia, an account of the breeding in captivity of the Black-faced Canary (*Serinus capistratus capistratus*). This breeding is of interest since, according to C. W. Mackworth-Praed and C. H. B. Grant in their work on the birds of Eastern and North-eastern Africa, the nest and eggs of this species have never been described. It is therefore through aviculture that we have been able to add to our knowledge of this species.

The Black-faced Canary is a small bird, about the size of the European Siskin (*Spinus spinus*). The cock is bright yellow in colour on the underside and much of the head. It has a black mask covering part of the throat and forehead and extending back over the ear-coverts. Mantle, nape, crown, and wing-coverts, are green with blackish streaks, and the flight feathers of wings and tail are blackish, with broad yellow edges. The hen lacks the black mask and the whole of the head and the upper breast are green with fine dark streaks.

The species is distributed across central Africa, from the southern Congo and northern Angola, to Northern Rhodesia and central and southern Uganda. Several races are recognized. There appears to be little known about its choice of habitat, although the eastern race, *S. c. koliensis*, has been recorded breeding in a swamp.

C. J. O. HARRISON.)

Some two years ago I obtained several pairs of the Black-faced Canary from a friend in the Belgian Congo. A few of the "hens" turned out to be cock birds in immature plumage. An accident occurred which cost me a few of them when a section of the roof of the aviary was lifted by the wind and they escaped. Eventually I finished up with two true pairs and these were placed in a large garden aviary in an attempt to breed them.

Further misfortune dogged my efforts when this garden aviary had to be demolished, due to an invasion of rats, so the first breeding season was unsuccessful.

In March this year I built a small rat-proofed enclosure 16 ft. by 6 ft. by 6 ft. and in it liberated about thirty waxbills and finches, together with the two pairs of Black-faced Canaries. Careful attention was paid to feeding and wild grass seed both dry and fresh, was offered, together with a staple diet of small panicum millet, termites, fresh apple, and lettuce.

Before long the birds began to come into breeding condition and it became necessary to remove one of the pairs of the canaries as they were being persecuted by the other pair, who obviously wanted to nest. A further fortnight was occupied in rather desultory nest-building, and eventually a small nest, some two inches in internal diameter, was completed in a bunch of heather tied up in the shelter of the aviary, the hen doing most of the work with very little assistance from the cock. It was composed of dry grass and fine rootlets, with a lining of very fine grass, being rather flimsy in structure ; and I had fears that it would not bear the weight of the brood. Four very pale slate-coloured eggs, speckled with liver brown and more heavily marked at the larger end, were laid. They were about the size of the eggs of the Green Singing Finch (*Serinus mozambicus*). I was unable to measure them as I did not wish to disturb the birds more than was necessary.

Incubation commenced two days after the laying of the last egg, i.e. on 11th April, and the first youngster appeared on 23rd April. The hen did all the incubation and for some days she brooded the youngsters very closely. On the 2nd May the parents were observed taking termites, and from this time onwards the cock took an increasing interest in his progeny.

On 6th May it was seen that the eyes of the youngsters were open and they were almost full-feathered. Of the four eggs three had hatched, one disappeared, and one of the youngsters died at the age of four days. The cock was now feeding the youngsters with gusto and on 12th May they left the nest. Examination of the nest showed that it had been fouled by the young.

Rearing was mainly done on lettuce and apple which were supplied once a day, in the morning. Termites were taken, but in relatively small quantities ; in fact I feel sure that these birds could be reared without live food. The apple and the lettuce, I would say, were essential.

On 28th May the two surviving young were independent. In colour the youngsters resembled the hen but were, of course, paler and less distinctly marked. They would appear to be a pair since one is definitely greyer in tone on the breast and belly.

One thing I noticed which appeared to be strange was that at no

time during the courtship was there any enthusiastic displaying by the male bird. It is possible, of course, that I did not observe the actual nuptial display although mating was seen to occur on two or three occasions. I will obviously have to pay more attention to this aspect if the pair decides to have a second brood, which already appears likely. Should this second brood materialize I shall attempt to measure the eggs and photograph them in colour.

* * *

INSECT CULTURING FOR SOFTBILLS

By F. MEADEN (Slough, Bucks., England)

The article, "Honey Bee Larvae (*Apis mellifera*) for Bird Food" by Norman E. Gary, Robert W. Ficken, and Robert C. Stein in January-February issue of the AVICULTURAL MAGAZINE has prompted these notes of mine on natural food for softbills. I am extremely interested in avian dietetics but keep, breed, and study the avi-fauna of northern Europe. However, the insects which we breed for our insectivorous collection will serve equally for most exotic species from further afield and I hope that the information given may prove useful to those wishing to experiment. Our softbill collection at the moment consists of Redstarts, Stonechats, Wagtails, Goldcrests, etc.; our Nuthatches, Buntings, Waxwings, and Rock-Thrushes also take their share of the numerous insects we offer and even the hardbills proper are not slow in accepting these tit-bits whenever available, although for the latter we always have regular supplies of gentles.

I am no entomologist so my miniature insectary has a very limited range; our insect culturing covers merely three species of moth, two of beetles, and, of course, the loyal old standby—the fruit fly. The insectary is a cupboard approximately a yard square by just a little over twelve inches deep and is situated in the birdroom, immediately above the tubular heaters. We find that by having a thermostat fitted inside the cupboard and set at 75° F. that the room itself is seldom over 50° F., even with the heaters on. We prefer that the heat should never be above this temperature in the winter as the Goldcrests have the freedom of the room during the cold months and too much heat softens them to such an extent that to attempt breeding from them in the open flights in early spring would be useless.

All the insects written of here can be cultured in 7 lb. confectionary jars or goldfish bowls kept at a steady 25° C. (77° F.) and relative humidity of 70 per cent, preferably in a dark position; each container should hold one pound of the appropriate food for the species of insect being bred. To facilitate simple pupating there should also be present three or four long one-inch wide strips of corrugated

packing paper rolled into three-inch diameter rolls, and secured with pins or elastic bands ; a six-inch long test-tube of water will prove an ideal drinker if a strip of blotting paper in the tube protrudes half-an-inch past the cork or stopper. For sub-culturing the moths, prepare the containers as above ; each should contain twenty-five to thirty full-grown moths. If conditions are suitable, breeding will commence almost immediately and with new jars started at various intervals a continuous supply can be maintained throughout the year. It is a simple matter to transfer the moths, their larvae, and pupae from such containers to the birds. A handful of the contents from the culturing jars will give a good day's supply of insects in their varying stages to any pair of small softbills, and, being enclosed in a lump of the food matter, they will in all probability last the whole day and not be eaten in one large feed as would ant pupae, caterpillars, etc. I must make it clear here that I do not attempt to feed our stock solely upon these insects as the normal basic diet is ever present in as wide a variety as can be given. However, there is no doubt that a continuous supply is appreciated ; any movement to the insectary door invariably brings many shining black eyes in that direction. The Goldcrests which are loose in the room help themselves whilst the insectary door is open, the caged specimens (during winter only) proceed to the nearest corner and await their turn.

Ephistia cautella is a very fast reproducing moth that requires little care, the larvae and pupae, needless to say, will also be taken by the birds. The food for this species consists of wheatfeed and glycerine in the proportion of five to one by weight. Considering that each female lays up to 200 eggs over a seven-day period whilst their life cycle is approximately forty-five days at the recommended temperature and conditions, it will be seen that they can prove a useful bird-food supplement.

Anagasta kühmella. The Mediterranean Flour Moth is similar in appearance to the former. Once again we have here a plump creature, soft of skin, which in larval form resembles the caterpillars to be found hanging from the oak trees in summer.

The feeding will give even less trouble since only wheatmeal is given and as they multiply as readily as the above species, little difficulty will be encountered providing one remembers their necessities in life ; fifty to fifty-five days is the life cycle in this case.

Achroia grisella. The Lesser Wax Moth is my own favourite as a bird food ; the moth seems to be even more fleshy and moist and the larva is noticeably larger, yet is freely taken by such mites as the Goldcrest. Although the food for this moth entails a little more work to mix, I honestly believe the time well spent since such food, nourishing in itself, must surely instil into the moth a high protein content most valuable to our birds. Their food is a mixture of wheatmeal, rolled oats, glycerine, and honey in the ratio of 6 : 6 : 1 : 1 ; I find the simplest method is to mix a cupful of each, honey and glycerine, in a large bowl

and then both of the cereals (six cups of each), the resulting mixture should be crumbly, but of a gluey nature.

Carpophilus dimidiatus. The Com-sap Beetle, barely any longer than a sixteenth of an inch, with the larva about three times this length, despite its small size is still a welcome addition. They are rarely missed by the birds when a handful of the culturing jar contents is placed in front of them in a shallow feeding vessel. Our Redstarts in particular seem to enjoy turning over the oatmeal on which the beetles are fed, not ceasing until the last one has disappeared; being small I suppose the food content is correspondingly low but, even so, the variety of diet is beneficial.

Tribolium castaneum. The rust-red Flour Beetle belonging to the family Tenebrionidae is a relative of the *Tenebrio molitor*, our old friend and foe the mealworm. It is the commonest pest of stored goods, being found on cereals and their products, oilseeds, bones, and in particular oriental dry foods. To breed this insect in large quantities the ideal mixture consists of half each rolled oats and wheatmeal. Under identical conditions to those advised for the moths, etc., they will multiply rapidly. The length of the beetle is approximately an eighth of an inch, it is of a lighter colour than the Com-sap Beetle and is easily distinguished from it. The larva is like a miniature mealworm, roughly a quarter of an inch in length, and is a great attraction to our birds, but being a relative of the mealworm I sometimes wonder if they could prove over fattening.

With all insect culturing beware of excess moisture and the fermentation of the food or mites and psocids will cause havoc in the culturing containers. These pests will not worry birds of course, but can be a nuisance when serious breeding of these valuable live foods is undertaken.

* * *

BREEDING OF THE INDIAN ROBIN

(*Saxicoloides fulicata*)

By Mrs. M. WILLIAMS (Cobham, Surrey, England)

I have only kept birds since October, 1960, and this is my very first attempt at breeding, by accident rather than design. Being so inexperienced I decided upon a bachelor aviary. This consists of a bird-house and an outside flight 14 by 8 feet by 6 feet high and contains about twenty birds: Weavers, Whydahs, Fruitsucker, Pekin Robins, Shama, Scarlet Tanager, Indigo Buntings, Verditer Flycatcher, and Saffron Finch.

The hen Indian Robin was purchased from Bleak Hall Bird Farm as a supposed cock, but when I saw some cock birds at another dealer I realized I had a hen; so I bought a cock and immediately I put him in the aviary he started displaying to the hen, but she would not have anything to do with him.

I had noticed that the hen did not care about roosting on perches but she tried to roost on a narrow sill at night, so I nailed a cardboard bird-carrying box (single bird size) to the outside top corner of the bird-house in the outside flight for her to roost in at night. Less than two weeks after the cock was put in the aviary I noticed the hen flying to the box with grass, obviously building a nest; no nesting material was supplied. She completed a nest of dried grass and moss in the box and laid four eggs about 14th and 15th May. The eggs were oval, whitish-blue, speckled and blotched light brown. Incubation was mostly by the hen but the cock inspected and sat in the opening of the box whenever the hen left the nest for brief periods. After thirteen days, on 28th May two young hatched. The feeding was carried out by both parents and this consisted entirely of live ant eggs for the first few days, then cleaned gentles and mealworms (strictly rationed), but mostly live ant eggs were eaten.

On 7th June at ten days old the two young left the nest, one about two hours after the first. They are now thirty-one days old and independent. They were fully feathered with greyish-brown breasts, brown wings, russet rump, and dark brown upright tails.

The young are still with their parents (27th June) and still roost at night in the same box.

The hen laid again but deserted after two eggs had been laid.

As described above, Mrs. M. Williams has bred the Indian Robin, *Saxicoloides fulicata*. It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

SOME RECENT RECORDS OF ANTING IN PASSERINE BIRDS

By K. E. L. SIMMONS (Woodley, Reading, England)

During the course of a recent study on problems of anting in birds, now more or less completed, I recorded anting in over 200 individual birds of ninety-six passerine species : eighty-eight species in captivity, five species (the Common Starling, Blackbird, Song-Thrush, Rook, and Common Jay) both in captivity and in the wild, and three species (the Robin, Blue Tit, and Chaffinch) in the wild only. No non-passerine, of numerous species observed, showed any sign at all of anting-behaviour.

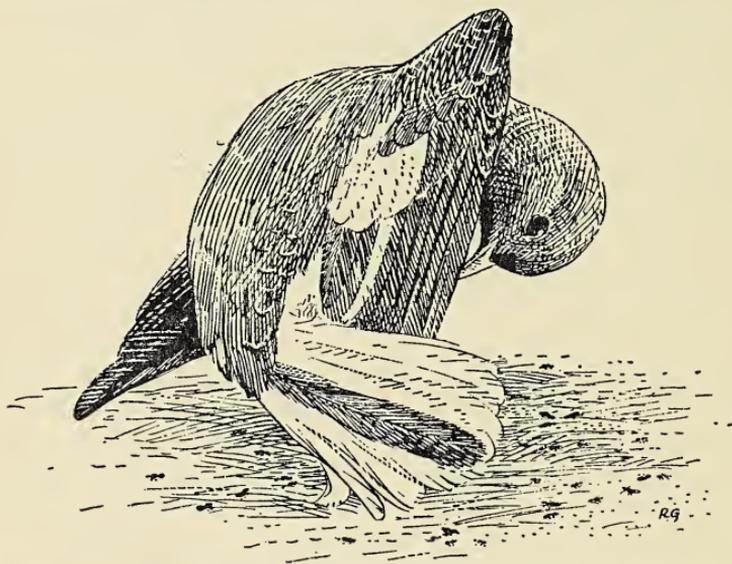


FIG. 1.—MAGPIE-ROBIN (*Copsychus saularis*) ANTING.

This species, like the majority of passerines observed anting, applies the ant with the bill directly to the under surface of the primary-tips (one wing at a time). The tail is postured to press against the wing in order to steady it for the anointing but is not itself usually treated (as was once thought).

(Sketch by Robert Gillmor.)

Of the birds watched in captivity, all anted under experimental conditions with worker-ants deposited in cages or flights and, in the case of tamer birds, with ants accepted from my fingers. The main species of ant used in these tests was *Formica rufa* (Wood Ant), a member of the formic-acid producing Formicinae. Some birds also anted with other ants of this group : *F. sanguinea* (Robber Ant), *F. fusca* (Slave Ant), *Lasius fuliginosus* (Jet-black Ant), *L. niger* (Garden Ant), *L. brunneus* (Brown Ant), *L. flavus* (Hill Ant) and *L. umbratus* (Lawn Ant).

In general, stinging ants are not used for anting and most of the few tests with these produced negative results. However, three very tame birds (a Hill Myna, Blue-winged Siva, and Yellow-backed (Brazilian) Hangnest) which were expecting Formicine ants from my fingers did ant with one or both of two species of Myrmicine ants: *Monomorium pharaonis* (Pharaoh's Ant) and *Myrmica rubra* (Red Ant).

Of the wild birds observed, Starlings, Blackbirds, Song-Thrushes, a Robin, a Jay, and a Blue Tit anted with Wood Ants deposited by me. Three Blackbirds, another Robin, and three Starlings were seen anting in natural conditions with Garden Ants. A Jay, a Rook, and a Blackbird, earlier in the study, were also seen anting with unidentified ants (probably the small yellow Hill Ants in the case of the Jay).

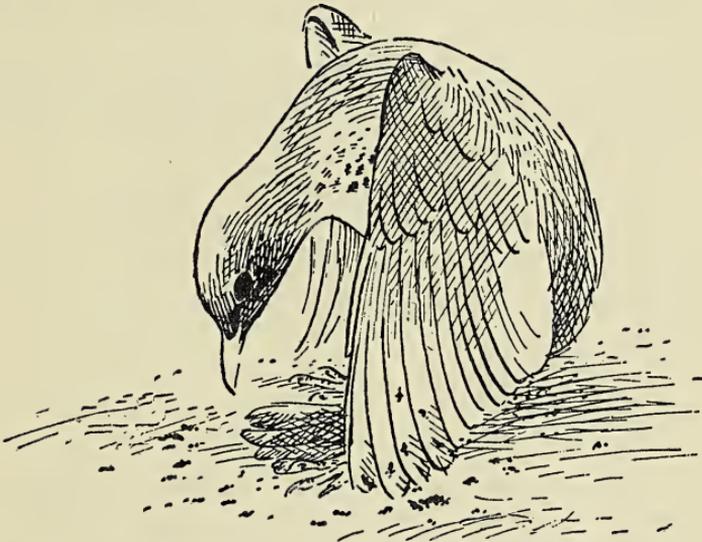


FIG. 2.—GREY THRUSH (*Turdus cardis*) ANTING.

A few species, principally the thrushes and crows, but also some small passerines such as the estrildine-finches, ant indirectly by assuming special postures to allow the ants to crawl on to their plumage. Most of the species which ant thus also apply ants directly with the bill, often at the same time, but the Grey Thrush (and a few other birds) usually go through the motions only of so doing, without actually picking up the ants.

(Sketch by Robert Gillmor.)

The topic of anting in birds has attracted considerable attention in recent years and a very large literature has grown up around it. In spite of this, however, there is practically no universal agreement on any of the major anting problems. There is not even agreement on what actually constitutes anting. One can read widely differing opinions and interpretations by recent authors, for example Poulsen (1956), Goodwin (1956), Simmons (1957), Whitaker (1957), Chisholm (1959), and Burton (1959). For a useful introduction to anting the

reader is referred, however, to a paper by Goodwin (1955) in these pages.

The purpose of the present note is to give, in convenient form, a list of the birds seen anting during my study over the years 1952 to 1961 and also of some other recent records (published and unpublished) which are additional to those in the latest list of anting species (Whitaker, 1957). A full account of my own work is in active preparation and brief reports on some aspects have already appeared (Simmons, 1958, 1959, and 1960).

The majority of the birds listed below were seen anting at the London Zoo. I am greatly indebted to Mr. J. J. Yealland (Curator of Birds) for giving me facilities for this work and for the help and interest shown by him and his staff. Further acknowledgements will be made elsewhere.

Of the ninety-six species forty-nine had not previously been recorded as anting. Also three additional families were added to the anting list. All these new records are indicated by heavy type.

LIST OF BIRDS SEEN ANTING 1952-61 *

Family **COTINGIDAE** (cotingas, etc.) :

Cock-of-the-Rock (*Rupicola rupicola*).

Family **PITTIDAE** (pittas) :

Bengal Pitta (*Pitta brachyura*).

Family **STURNIDAE** (starlings) :

Malayan Glossy Starling (*Aplonis panayensis*), **Purple Glossy Starling** (*Lamprocolius purpureus*), **Blue-eared Glossy Starling** (*Lamprocolius chalybeus*), **Long-tailed Glossy Starling** (*Lamprotornis caudatus*), **Emerald Starling** (*Coccycolius iris*), **Superb Starling** (*Spreo superbus*), **Wattled Starling** (*Creatophora cinerea*), **Common Starling** (*Sturnus vulgaris*), **Grey Starling** (*Sturnus cineraceus*), **Silky Starling** (*Sturnus sericeus*), **Chinese Starling** (*Sturnus sinensis*), **Grey-headed Myna** (*Sturnus malabaricus*), **Black-necked Grackle** (*Sturnus nigricollis*), **Black-winged Grackle** (*Sturnus melanopterus*), **Bali Grackle** (*Leucopsar rothschildi*), **Indian Jungle Myna** (*Acridotheres fuscus*), **Common Myna** (*Acridotheres tristis*), **Bank Myna** (*Acridotheres ginginianus*), **Hill Myna** (*Gracula religiosa*).

* I have followed no currently accepted systematic-order but that one which seems most natural to me. I have preferred not to lump certain well-known groups together in large composite families, as is the modern trend, because the relationships in certain cases are questionable and over-lumping of groups can obscure phylogeny as much as, or even more, than over-splitting. On the other hand, it must be admitted that certain groups (e.g., the tanagers) are artificial ones but they are kept for convenience.

Family TURDIDAE (thrushes, etc.) :

Song-Thrush (*Turdus philomelos*), Mistle-Thrush (*Turdus viscivorus*), Blackbird (*Turdus merula*), American Robin (*Turdus migratorius*), Grey Thrush (*Turdus cardis*), **Blue Whistling Thrush** (*Myophonus caeruleus*), Magpie-Robin (*Copsychus saularis*), Shama (*Copsychus malabaricus*), **Chorister Robin-Chat** (*Coscypha dichroa*), **Indian Blue Robin** (*Luscinia brunnea*), **Robin** (*Erithacus rubecula*).

Family MUSCICAPIDAE (flycatchers) :

Sooty Flycatcher (*Muscicapa siberica*), Rufous-bellied Niltava (*Niltava sundara*).

Family TIMALIIDAE (babblers) :

Common Babbler (*Turdoides caudata*), **Black-capped Babbler** (*Turdoides reinwardii*), **Lanceolated Babbler** (*Babax lanceolatus*), **Masked Jay Thrush** (*Garrulax perspicillatus*), White-throated Jay Thrush (*Garrulax albogularis*), **Collared Jay Thrush** (*Garrulax pectoralis*), White-crested Jay Thrush (*Garrulax leucolophus*), Black-throated Jay Thrush (*Garrulax chinensis*), **Kansu Jay Thrush** (*Garrulax sukatschewi*), **Rufous-chinned Jay Thrush** (*Garrulax rufogularis*), **Melodious Jay Thrush** (*Garrulax canorus*), **White-browed Jay Thrush** (*Garrulax sannio*), Silver-eared Mesia (*Leiothrix argentauris*), Pekin Robin (*Leiothrix lutea*), Blue-winged Siva (*Siva cyanuroptera*), **Black-chinned Yuhina** (*Yuhina gularis*).

Family PARADOXORNITHIDAE (crow-tits) :

Grey-headed Crow-Tit (*Paradoxornis gularis*).

Family PARIDAE (tits) :

Blue Tit (*Parus caeruleus*).

Family CORVIDAE (crows, etc.) :

Carrion Crow (*Corvus corone*), Rook (*Corvus frugilegus*), **Black Pie** (*Ptilostonus afer*), Magpie (*Pica pica*), Blue Magpie (*Urocissa erythrohyncha*), Green Magpie (*Cissa chinensis*), Common Jay (*Garrulus glandarius*), Lanceolated Jay (*Garrulus lanceolatus*), Purple Jay (*Garrulus lidthi*), Beechey's Jay (*Cissalopha beecheyi*), **Pileated Jay** (*Cyanocorax chrysops*).

Family PARADISAEDIAE (birds-of-paradise) :

Magnificent Bird-of-Paradise (*Diphyllodes magnificus*).

Family PTILONORHYNCHIDAE (bowerbirds, etc.) :

Satin Bowerbird (*Ptilonorhynchus violaceus*) **Yellow-breasted Bowerbird** (*Chlamydera lauterbachii*).

Family DICRURIDAE (drongos) :

Large Racket-tailed Drongo (*Dissemurus paradiseus*).

Family ZOSTEROPIDAE (white-eyes) :

Indian White-eye (*Zosterops palpebrosa*).

Family PLOCEIDAE (weavers) :

Grosbeak Weaver (*Amblyospiza albifrons*), Long-tailed Widowbird (*Euplectes progne*), **Yellow-mantled Widowbird** (*Euplectes macrourus*), Jackson's Widowbird (*Euplectes jacksoni*), Yellow-crowned Bishop (*Euplectes afer*), Red Bishop (*Euplectes orix*), **Black-headed Weaver** (*Ploceus cucullatus*), **Rüppell's Weaver** (*Ploceus galbula*), **Chestnut-backed Black Weaver** (*Ploceus nigerrimus castaneifuscus*), **Black-necked Weaver** (*Ploceus nigricollis brachypterus*), **Red-headed Quelea** (*Quelea erythropis*), **Red-beaked Quelea** (*Quelea quelea*).

Family ESTRILDIDAE (estrildine finches) :

Avadavat (*Amandava amandava*), Golden-breasted Waxbill (*Amandava subflava*), **Crimson Finch** (*Neochimia phaeton*).

Family FRINGILLIDAE (typical finches) :

Chaffinch (*Fringilla coelebs*), **Lesser Black-tailed Hawfinch** (*Eophona migratoria*).

Family PYRRULOXIIDAE (cardinal-grosbeaks) :

Virginian Cardinal (*Pyrruloxia cardinalis*).

Family THRAUPIDAE (tanagers) :

Magpie Tanager (*Cissopsis leveriana*), **White-capped Tanager** (*Stephanophorus diadematus*), Superb Tanager (*Calospiza fastuosa*), **Golden-masked Tanager** (*Calospiza nigrocincta*).

Family EMBERIZIDAE (buntings, etc.) :

Black-throated Cardinal (*Coccyzus gularis*), **Red-headed Cardinal** (*Paroaria dominicana*), **MacConnell's Sparrow** (*Zonotrichia capensis*).

Family ICTERIDAE (troupials, etc.) :

Common Hangnest (*Icterus icterus*), **Golden Hangnest** (*Icterus nigrogularis*), Yellow-backed Hangnest (*Icterus jamacaii*).

N.B.—Robert Gillmor accompanied me on the last series of lists at the London Zoo, in June, 1961, and two of the above records—of Long-tailed Glossy Starling and Yellow-breasted Bowerbird—are due to him.

FURTHER RECORDS

In all, some 201 species of passerines have now been recorded anting. The last full tally, with bibliography, was that of Whitaker (1957), an identical list (without references) being given also by Burton (1959). In Mrs. Whitaker's list, 131 species of passerines were included. The additional seventy-five species are made up as follows :

(1) Forty-nine new records from the list published here (species in bold type) ;

(2) Six further species recorded first by other observers and also by me since Whitaker's list appeared, namely

Grey Starling (Kuroda, 1957), Grey Thrush (Fushihara, 1959), Blue Tit (Muddeman, 1960, Simmons, 1958), Avadavat (Goodwin, 1960), Golden-breasted Waxbill (Proctor, Goodwin, 1960), Magpie Tanager (in Chisholm 1960);

(3) Fifteen additional species listed below.

Family PYCNONOTIDAE (bulbuls):

Red-whiskered Bulbul (*Otocompsa jocosca*); Mrs. D. E. Bucksey (*in litt.*). (This is the only anting record for this family.)

Family MOTACILLIDAE (wagtails and pipits):

Meadow Pipit (*Anthus pratensis*); Holt (1960), Stevens (1960), K. D. Smith (*in litt.*).

Family MUSCICAPIDAE:

Grey Shrike-Thrush (*Colluricincla harmonica*); in Chisholm (1959).

Family SYLVIIDAE (warblers):

Garden Warbler (*Sylvia borin*); Sauer (1957).

Family MALURIDAE (fairy-wrens, etc.):

Blue Wren (*Malurus cyaneus*); in Chisholm (1959). Yellow-tailed Thornbill (*Acanthiza chrysorrhoa*); in Chisholm (1959), Hobbs (1960).

Family GRALLINIDAE (magpie-larks):

White-winged Chough (*Corcorax melanorhamphus*); in Chisholm (1959).

Family CRACTICIDAE (bell-magpies):

Pied Crow-Shrike (*Strepera graculina*); in Chisholm (1959).

Family CORVIDAE:

Australian Raven (*Corvus coronoides*); in Chisholm (1959), Hobbs (1960). Steller's Jay (*Cyanocitta stelleri*); Ivor (1958).

Family PTILONORHYNCHIDAE:

Regent Bowerbird (*Sericulus chrysocephalus*); in Chisholm (1960).

Family ESTRILDIDAE:

Melba Finch (*Pytelia melba*); Proctor. Black-bellied Seed-cracker (*Pirenestes ostrinus*); Crook and Allen (1960).

Family THRAUPIDAE:

Blue-and-black Tanager (*Calospiza velia*); Mrs. D. E. Bucksey (*in litt.*). Scarlet Tanager (*Ramphocelus bresilius*); in Chisholm (1960).

DISTRIBUTION OF ANTING RECORDS IN PASSERINE FAMILIES

For the sake of those who have not access to Mrs. Whitaker's (or Burton's) list, I give below a list of passerine families together with the number of species in each recorded as anting.

RHINOCRYPIDAE (tapaculos); no records.

CONOPOPHAGIDAE (ant-pipits); no records.

FORMICARIIDAE (ant-birds, etc.) ; no records.

FURNARIIDAE (ovenbirds) ; no records.

DENDROCOLAPIDAE (woodcreepers) ; one species.

TYRANNIDAE (tyrants) ; one species.

PHYTOTOMIDAE (plantcutters) ; no records.

PIPRIDAE (manakins) ; no records.

COTINGIDAE (cotingas, etc.) ; one species.

EURYLAIMIDAE (broadbills) ; no records.

PITTIDAE (pittas) ; one species.

PHILEPITTIDAE (philepittas) ; no records.

XENICIDAE (New Zealand wrens) ; no records.

MENURIDAE (lyrebirds) ; no records.

ATRICHORNITHIDAE (scrub-birds) ; no records.

ALAUDIDAE (larks) ; no records.

HIRUNDIDAE (swallows, etc.) ; no records.

ORIOLIDAE (old world orioles) ; no records.

CAMPEPHAGIDAE (cuckoo-shrikes) ; no records.

PYCNONOTIDAE (bulbuls) ; one species.

IRENIDAE (leafbirds) ; two species.

BOMBICILLIDAE (waxwings) ; one species.

ARTAMIDAE (wood-swallows) ; no record.

STURNIDAE (starlings) ; twenty-two species.

MOTACILLIDAE (pipits and wagtails) ; two species (both pipits).

PRUNELLIDAE (accentors) ; no records.

TROGLODYTIDAE (wrens) ; no records.

CINCLIDAE (dippers) ; two species.

MIMIDAE (mocking-birds, etc.) ; two species.

TURDIDAE (thrushes, etc.) ; twenty species.

MUSCICAPIDAE (flycatchers, etc.) ; six species (one doubtful).

SYLVIIDAE (warblers, etc.) ; one species.

REGULIDAE (goldcrests) ; one species (needs confirming).

MALURIDAE (fairy-wrens, etc.) ; two species.

PICATHARTIDAE (picathartes) ; no records.

TIMALIIDAE (babblers) ; twenty-three species.

PARADOXORNITHIDAE (crow-tits) ; one species.

REMIZIDAE (penduline tits) ; no records.
 AEGITHALIDAE (long-tailed and bush tits) ; no records.
PARIDAE (true tits) ; one species.
 SITTIDAE (nuthatches) ; no records.
 CERTHIDAE (creepers) ; no records.

PRIONOPIDAE (helmet-shrikes) ; no records.
 VANGIDAE (vangas) ; no records.
LANIIDAE (true shrikes) ; one species (needs confirming).
 MALACONOTIDAE (bush-shrikes) ; no records.

CALLAEIDAE (wattlebirds) ; no records.
GRALLINIDAE (magpie-larks) ; three species.
CRATICIDAE (bell-magpies) ; two species.
CORVIDAE (crows, etc.) ; twenty species.
PARADISAEIDAE (birds-of-paradise) ; one species.
PTILONORHYNCHIDAE (bowerbirds) ; four species.
DICRURIDAE (drongos) ; one species.

DICAEIDAE (flowerpeckers) ; no records.
 NECTARINIDAE (sunbirds) ; no records.
ZOSTEROPIDAE (white-eyes) ; one species.
MELIPHAGIDAE (honey-eaters) ; one species.

PLOCEIDAE (weavers, etc.) ; seventeen species.
PASSERIDAE (sparrows) ; one species (needs confirming).
ESTRIDIDAE (estrildines) ; seven species.
FRINGILLIDAE (typical finches) ; five species.

VIREONIDAE (vireos) ; no records.
 DREPANIDIDAE (honey-creepers) ; no records.
PARULIDAE (wood-warblers) ; one species.
COEREBIDAE (sugarbirds) ; one species.
PYRRULOXIIDAE (cardinal-grosbeaks) ; seven species.
THRAUPIDAE (tanagers) ; eleven species.
EMBERIZIDAE (buntings, etc.) ; thirteen species.
ICTERIDAE (troupials) ; fourteen species.

Aviculturists are in an especially favourable position to make observations on anting, particularly in rare or otherwise inaccessible species. All types of information are needed, however, and I would encourage observers to publish their experiences. I would be most interested to receive any records of true anting (with ants) by passerines.

Records should be as full as possible and contain the following basic information :

- (1) name of bird(s), English and scientific ;
- (2) name of ant (if authoritatively identified) or a description or actual specimens ;
- (3) description of behaviour (a) initial response to the ants, (b) whether the bird picked up the ant in its bill and applied it to its plumage, (c) if so, to which plumage areas and in what posture ; (d) whether the bird did not pick up the ant but postured as if applying it or postured to allow the ants to crawl on to its plumage, (e) fate of the ant (i.e., eventually eaten or dropped).

I would also appreciate notice of any overlooked references to anting in the avicultural literature, especially in *Cage Birds* and in the older volumes of the AVICULTURAL MAGAZINE. Instances of anting may well be hidden away in general articles ; for instance, I was browsing through some odd numbers of our magazine lately and came across an undoubted reference to anting by the Pekin Robin in an article by Butler (1913).

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ON REARING A KOOKABURRA OR LAUGHING JACKASS (*Dacelo gigas*) ARTIFICIALLY IN THE BASLE ZOO

By Dr. HANS WACKERNAGEL (Basle Zoological Gardens, Switzerland)

Since 29th May, 1953, two Kookaburras have made their home with us in the Basle Zoo. The birds, which were from the outset assumed to represent a pair, occupy a roomy aviary inside the bird house with direct access to a flight cage out of doors, the latter being some twice the size of the former. Kookaburras are perfectly suited to our climate and our birds make full use of the outdoor cage in summer and winter alike. Sharing quarters with them are a Victoria Crowned Pigeon, a pair of Ringed Teal, a pair of Black-tailed Waterhens from Australia, a pair of Bleeding-heart Pigeons, and a pair of Red-vented Bulbuls. We give the Kookaburras a mixed feed that is fed to all the cage birds in the zoo, supplemented by freshly killed white mice.

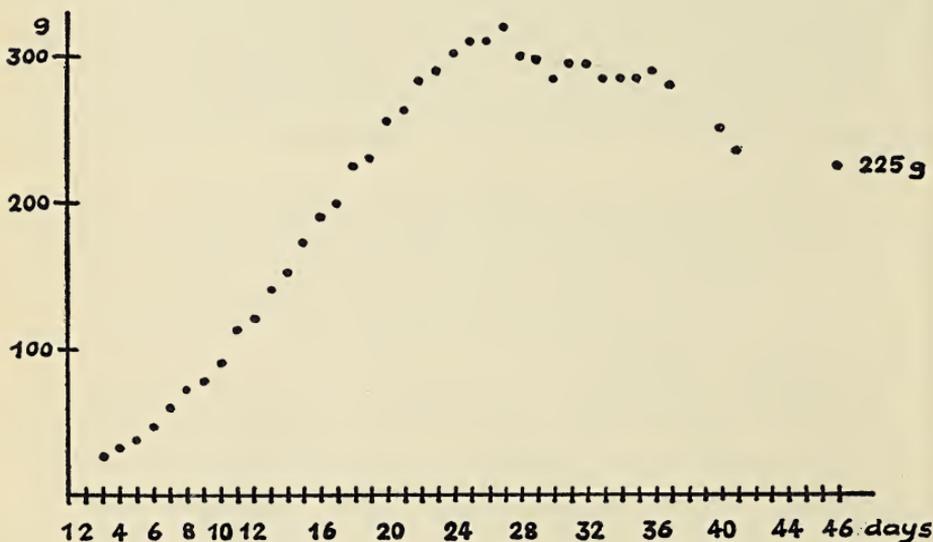
In a corner of the indoor aviary we fashioned, with the help of a few boards, a hollow some 20 cm. high and 30 cm. deep underneath a mound composed of peat and sand. The whole floor is otherwise covered with a 10 cm. deep layer of this peat and sand mixture. At the entrance the hollow measures some 20 cm. across and widens slightly towards the back.

In 1959 our Kookaburras made their first breeding attempt. On 26th April an egg lay in the hollow, but by the next day it had been broken. A further two broken eggs were found on 1st and 4th May respectively. There had not been any nesting material carried into the hollow, the floor of which, just as the aviary floor, consisted of peat and sand.

The pair showed no further interest in the nesting place until April, 1960. On 29th of that month we observed the first egg, and on 2nd May there was a clutch comprising two eggs. This time the birds began to sit in earnest. Then, on 25th May, 1960, the keeper observed one of the parent birds flying up on to a branch in the aviary, carrying in its beak a newly hatched chick. Several times it struck its victim against the branch, after which it proceeded to devour it. In the light of this behaviour the second, still intact egg was removed without delay to an incubator. The young Kookaburra hatched early in the morning of 26th May. We were thus able to establish an incubation period of twenty-four to twenty-six days. For the first day we left the chick in our large motor incubator in a temperature of about 37° C. On the second day it was removed to a smaller incubator the temperature of which we first set at 30° C., reducing it later to 27° C. The young bird lay in a small cardboard

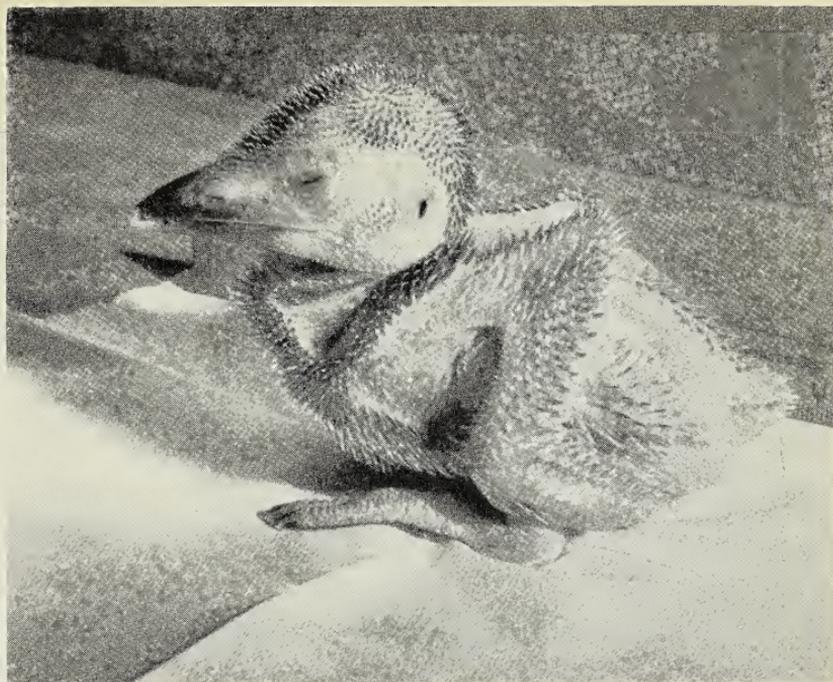
box lined with hay which was in turn covered with a paper handkerchief which could be changed as required. We kept the nest, together with its tiny occupant, slightly moist by spraying it lightly with water now and then.

Naturally we were not unduly optimistic about raising this helpless nidicolous bird. We were well aware that similar attempts with birds of this type had seldom before met with success. But fortunately, from the beginning, the youngster gave every appearance of being normal and healthy. At first we fed it every half-hour with a two hour's break at midday during the day, and once at night between 10 and 12 o'clock. The food was offered with a pair of tweezers. As



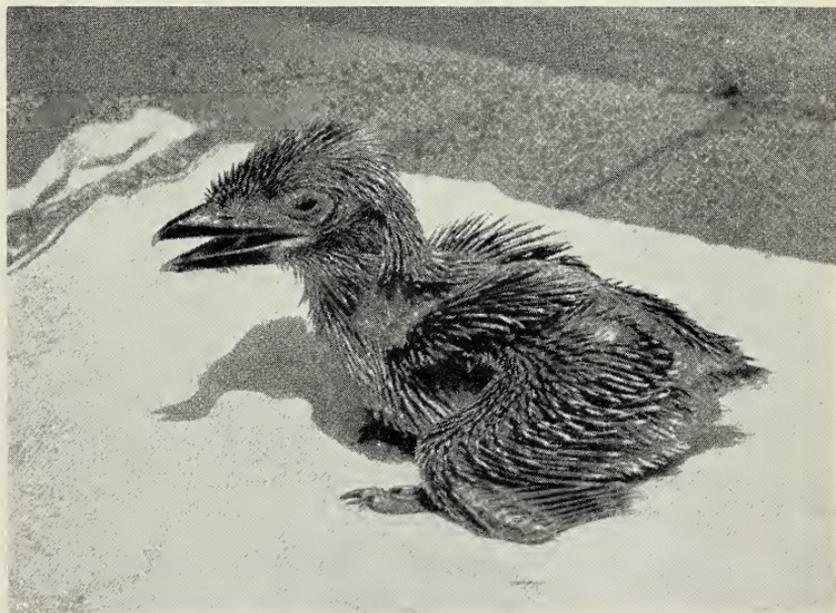
On the third day, 28th May, 1960, when we began keeping check, our Kookaburra weighed 26 grams. It grew very rapidly and by the twenty-seventh day had attained a maximum weight of 320 grams. By the time he was ready to fly his weight had fallen to 225 grams. This so-called post-embryonic superweight is typical of nidicolous birds (Portmann, 1955) and is put down to a vigorous development of the intestine and liver during the most intensive period of growth.

a rule the Kookaburra would eagerly snap at the food the moment it touched its beak. Sometimes, however, it needed encouraging, which involved opening its beak very carefully. During the first three days of its life we fed it on the entrails of white mice—heart, liver, kidney, stomach, and some ant eggs. Immediately before the food was given we dipped it in Ringer solution, containing a solution of pepsin and hydrochloric acid (ten drops to a dl.) to alleviate the digestive processes and to avoid a too heavy loss of fluid. In addition, it received one to two drops of our humming bird food with each feed,



YOUNG KOOKABURRA.

On the thirteenth day the feathers were beginning to show.
The next day the eyes opened.



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[Basle Zoo

YOUNG KOOKABURRA.

On the nineteenth day the youngster might be taken for a hedgehog. It still has
five days to wait before the feathers begin unfolding.

[To face p. 134



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[Basle Zoo

YOUNG KOOKABURRA.

The Kookaburra at forty-eight days old asserts its complete independence. At a press conference on this day it flew through the whole bird house. It can also feed itself.

and one drop of "Protovit liquid" (Roche) daily. From the fourth day on we added to its diet haunches of mice, the bones of which had previously been crushed with a hammer, and crickets of our own breeding. As a result our young protégé every now and then disgorged pellets. These were seen to contain the remains of chitin and bones. The excrements were, in view of the diet, constantly fairly moist and consisted of white uric acid and a dark coloured solid matter. From the sixth day on we gave only hourly feeds and added to the meals tiny balls of our mixed feed for cage birds, and small pieces of fish.

To our delight the small bird developed steadily without causing us any particular anxiety—our greatest concern was not to give it too much food at once. The accompanying photographs and weight table will show at a glance the various stages in its development. Our observations concerning its growth were found to agree with those made on another bird of the same species which had been raised by its parents in the Wassenaar Zoo. A detailed description of the development of this particular bird was published in this Journal by H. A. Gerrits (1958). The comparison shows that a perfectly natural development can be achieved under artificial conditions provided sufficient care is exercised. At first our Kookaburra was completely naked, his whole appearance being dominated by the huge belly with the intensively working digestive organs. The first pin-feathers began to show on the wings only on the ninth day. On the fourteenth day the eyelids gradually opened and powerful quills appeared. The feathers now began growing rapidly, and we could remove our young charge from the incubator to a small box lined with peat and hay, placed on an electrically-heated board. The bottom of the nest was kept at a temperature first of approximately 30° C. then later at approximately 25° C. On the twenty-fourth day the quills began to unfold. At length, although the eyes had been open for some time already, we observed a certain reaction to optical stimuli. When a hand was passed over the box the bird cowered down into the recesses of its nest, and on the thirtieth day we noticed it looking after the flies buzzing overhead. The lenses, however, were still clouded. Our Kookaburra had now become strong enough to do without the two late evening feeds. It received two drops of "Protovit liquid" (Roche) daily while the pepsin-hydrochloric acid solution was dispensed with. On the twenty-seventh day it had reached its maximum weight and its appetite fell off markedly. Hereafter we only fed it when it was hungry and begged for food. On the fortieth day the bird seemed ready to fly and it was put into a cage, where on the following day it took up its position on a branch. For the first time also its characteristic laugh could be heard. On the forty-eighth day it ate independently; unabashed, it seized whole mice in its beak, striking them after the fashion of the parent birds against a

branch or on the ground before devouring them. On the forty-ninth day we introduced it to the Press, on which august occasion it suddenly lifted its wings and made an impressive flight all round the bird house. In eighty-two days it graduated to an outdoor cage. At first we put it there only during the daytime ; soon, however, it was left outside at night too, and finally it accepted it as its quarters throughout the whole winter. To-day it never fails to delight us with its excellent health and tame nature.

There only remains to be said that the parents nested again in June, 1960, and laid two eggs. The young ones hatched on 15th July and were this time reared irreproachably by the parent birds. They left the nest on 18th and 20th August at the ages of thirty-four and thirty-six days respectively. While they were rearing their young we gave the parent birds, in addition to their normal feed, mice cut up in four or five parts. Each of these parts was enriched with a drop of " Protovit liquid " (Roche).

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* * *

NESTING OF THE SPLENDID PIGEON

(*Columba speciosa*)

By PROFESSOR CARL NAETHER (Encino, California, U.S.A.)

In December, of 1957, while still residing at my old home on Woodman Avenue in Sherman Oaks, I had occasion to import five specimens of the very handsome, large Splendid Pigeon, which the exporter called Scalloped-neck Pigeon. It is a forest dweller, mainly arboreal, and hails from South and Central America. After moving the pigeons to my new home in Encino in January of 1958, I let a fellow-fancier select what proved to be a true pair, placing the remaining three birds in a roomy pen by themselves.

These beautiful, red-billed pigeons were very shy for many months, even though kept in a solidly-covered pen, where they were well-protected from the usual nocturnal marauders, such as owls, cats, opossums, and the like. During the day they were wont to perch high, descending to the floor of the pen only when in search of food and drink. All three pigeons were, and are to this day, amiable—there

has never been any fighting among them, which, to say the least, is noteworthy since almost all other species of pigeons, especially breeding pairs, will when nesting become aggressive—naturally so in defence of their breeding territories.

During 1958, 1959, and 1960, the Splendid Pigeons made no attempt whatever at nesting. In point of fact, I did not know whether or not there was a true pair among the three, for I have never heard any cooing, nor have I seen any mating or nest-building activities. This despite the fact that I have had these newcomers under almost continual observation ever since I was so fortunate as to obtain them. Never in all my dove and pigeon-keeping experience, extending over more than thirty years, have wild, imported pigeons taken more than three years to "let me know" that they were capable of breeding. I thought all along that I had three hens, particularly since these pigeons were so very inactive in their behaviour, and also almost "voiceless". I might add here that the pair sold to a fellow-fancier has behaved similarly and has made no attempt at nesting thus far.

Four weeks ago I was agreeably surprised to see one of the Splendid Pigeons sitting in a nest-box, five feet off the ground, which I had filled with dry grass-cuttings. Since incubation continued also during the night, I began to suspect that there might be a true pair among the three birds, for among pigeons it is the rule for the male to incubate from about 10 a.m. to 4 p.m., the hen taking over during the remaining time. Moreover, it is rare for a hen pigeon to incubate also during the day-time, even though such cases have occurred. Owing to the shyness of the Splendid Pigeons, I was very careful not to disturb them in any way or even to approach within three feet of their nest. When, after about twenty days, the nest was left permanently, I found two white eggs in it, the size of domestic pigeon eggs, both being infertile. Not having bred this species before, I do not know whether it lays only one egg at each setting or two eggs. If only one egg, then it may be that two hens laid in the nest, their first since importation in 1957! (Jean Delacour, who calls this magnificent pigeon the "Fair Pigeon" does not mention any egg-laying habit of this species in his informative "Wild Pigeons and Doves.")

I should add that there is hardly any difference in the coloring of the three birds, one of them showing a somewhat richer maroon on the wings and a more greyish-white on the neck. As to size, all three pigeon are the same.

Some weeks ago the pigeons sat again in the same nest—day and night. Six of seven days ago, two of them began to sit side by side in the nest—a fairly sure, though by no means conclusive, sign of their having hatched young. To-day (14th May, 1961) there was no pigeon on the nest; so I examined it and to my surprise found a week-old squab in it, but dead. Covered with dark-blue fuzz, the squab, which

had a full crop, seemed strong and healthy. I am at a loss to know why it died. At any rate, the secret is finally out—I *do* have a true pair of Splendid Pigeons among my three birds, of which fact I am very glad, for to the best of my knowledge, there has been no nesting of *Columba speciosa* IN THIS COUNTRY ; and I should be grateful to any member of our Society for information of a previous successful nesting or raising of this splendid bird. In 1943, I was in possession of a single Splendid Pigeon, which happened to be part of an importation from Central America. Professor Gifford of Oakland, who was then a very active and ardent dove-breeder and who had never kept this species, asked me for it and got it. He was, however, unable to obtain a mate for this pigeon.

Incidentally, since I found but one squab in the nest and nothing else, it may be assumed that the Splendid Pigeon, like many of the larger Columbidae, lays but one egg at a sitting. These pigeons are fond of whole corn (maize) and also of small squares of longhorn cheese. Mealworms do not seem to be to their liking. At this writing, the breeding season is still young ; it is quite likely, therefore, that there will be further attempts at nesting by these pigeons, some of which, I trust, may be successful.

* * *

OBITUARY

E. N. T. V.

2nd November, 1903, to 29th May, 1961

Edward Nevill Tempest Vane, known throughout the avicultural world as "Ted", was undoubtedly a very great authority on the keeping and breeding of psittacines. His interest in these birds was life-long and he must at one time or another have owned almost as many species as anyone within living memory. Since the last war he had built up a large and representative collection and the number of species bred annually testify to his skill in that direction. His favourite group was perhaps the Grass Parrakeets, but actually he had no particular favourites, anything parrot-like was of absorbing interest to him. Hybrids he did not much care about but the breeding of mutations greatly appealed to him and his success with lutino Nyasa Lovebirds and blue Ring-necked Parrakeets is well known to all interested in the production of colour varieties. He was awarded four of the Society's medals for first breedings : Bauer's Parrakeet, 1938 ; Noble Macaw, 1949 ; Moustache Parrakeet, 1953 ; and Canary-winged Parrakeet, 1954.

A great advocate for the absolute necessity of building up and maintaining breeding stocks of the rarer parrakeets, he was ever helpful with advice as to how this could best be done.

Vane was elected a member of the Society in 1937, served for two terms on the Council, and was one of the Society's representatives on the Executive Committee of the National Council of Aviculture. He was an enthusiastic supporter of the British Aviculturists' Club since its foundation in 1946, and rare indeed were the occasions that he failed to attend a meeting. He was also closely connected with the Foreign Bird League and had been President for the past ten years. His writings in the AVICULTURAL MAGAZINE, *Foreign Birds*, and *Cage and Aviary Birds* were numerous and on a wide variety of subjects, but, let it be said, he never rushed into print, and his articles were invariably informative or instructive. His *Guide to Lovebirds and Parrotlets* was published in 1959, and enjoyed an immediate popularity.

The last years of his life were marred by illness and he was denied the pleasure of looking after his birds himself. It was essential that he should conserve his physical energy and in no way over-tire himself, so he decided to devote his time to writing a monograph of the great family of parrots. It was his intention to cover the near eight hundred forms illustrated by his own paintings, for early in his enforced inactivity he had discovered that he was possessed of considerable artistic ability. This monumental undertaking is about two-thirds finished and it is to be sincerely hoped that some way may be found to complete it so that it may eventually be published. It would indeed be tragic if so much research and skilful compilation were to be wasted.

He was also a skilled photographer and had built up an extensive library of photographs of birds.

In his passing British aviculture has lost a great and well-informed enthusiast and the Society and Club a staunch supporter. His many friends have suffered a loss which is too great adequately to express.

A. A. P.

LONDON ZOO NOTES

By J. J. YEALLAND

There has been a long and interesting list of new arrivals of which four species have not previously been exhibited in Regent's Park.

These are the Lesser Flamingo (*Phoeniconaias minor*), the Montezuma Oropendola (*Gymnostinops montezuma*), the Rufous Laughing Thrush (*Garrulax* or *Dryonastes poecilorhyncha berthemyi*), and the Black-eared Wheatear (*Oenanthe hispanica hispanica*).

The Lesser Flamingo inhabits certain areas of Africa, Madagascar, and north-western India, sometimes living in vast flocks. In recent years much has been discovered and published about the life of this formerly little known bird.

The Montezuma Oropendola inhabits forested parts of Central America, living in colonies. The nests, sometimes very many together, are suspended from the branches of trees. They are sleeve-like structures as much as 6 feet in length with an opening near the top.

The Rufous Laughing Thrush is written of by La Touche (*Birds of Eastern China*) who says "This beautiful bird has, so far, only been found in the higher mountains of North-West Fohkien (Fuhkien). It is a forest bird, and very little seems to be known of its habits. It has a very beautiful voice, and should be an extremely interesting aviary-bird". It is now known also to live in Szechuan. There is another race in Formosa and one in northern Yunnan.

The Black-eared Wheatear is one of those collected in Spain during 1960 by Mr. M. D. England who hand-reared a nest of them.

A Stripe-breasted Star-throated Humming Bird (*Helimaster squamosus*) and three Ruby and Topaz (Ruby-crested) are among new additions to the Tropical House. Two Ostriches, a Bronze-tailed Peacock Pheasant (*Polyplectron chalcurum*), three Scintillating Copper Pheasants, six Auriculated or Violet-eared Doves, two Galapagos Doves, a Jobi Island Dove, and three Lemon Doves have also been received. I was interested to see this last species which Mr. Prestwich bred for the first time in this country, for Durrell and I brought one of the other species (*Aplopelia simplex*) from the Cameroons in 1948 and this specimen lived in Capt. Clarence's aviaries for some time. Mr. Spence has, I believe, some in his collection now.

Two Hammerkops (*Scopus umbretta*), three North American Turkeys, a female Kori Bustard, and two Javan Parrakeets (*Psittacula a. alexandri*) are also noteworthy additions. Two Black-footed Penguins, a Gannet, two Cormorants, and three Turquoise Parrakeets are among those bred in the Gardens.

NEWS AND VIEWS

K. A. Norris reports that he has a young Niltava flying ; also that two female Red-winged Blackbirds mated to one male have nests of young in the same aviary.

* * *

Longevity. A Javan Rhinoceros Hornbill died in the New York Zoological Park, on 5th January, 1961. It had been in the collection since 11th January, 1937—just six days short of twenty-four years.

* * *

J. O. D'earth reports an interesting case of fertility in hybrid Pintail Ducks. A male Chilean mated with a Bahama \times Red-billed hybrid female. A clutch of eight eggs proved 100 per cent fertile—all eight hatched but, unfortunately, none was reared.

* * *

The Bronze Medal of the Avicultural Society of South Australia has been awarded to I. Boaden, for the first breeding of the Purple-gaped Honey-eater *Meliphaga cratitia*, and to B. Thomas for the first breeding of the Spotted Crane *Porzana fluminea*.

* * *

Dr. Heinz Heck, Catskill Game Farm, U.S.A., has bred the King Vulture. One young one was hatched on 11th May, 1960, after fifty-six days incubation. At the time of the report it was ten months old and doing well. Possibly it is the first to be bred in captivity.

* * *

On 11th March, 1961, the Addison Emery Verrill Medal was presented to Jean Delacour. This Medal is awarded annually by the Trustees of the Peabody Museum of Natural History, Yale University, to individuals who have made outstanding contributions to the field of natural history.

* * *

The "Darenth-Hulme" collection has now been dispersed. The whole district is being developed to the limit and as this property is just about the last available site on the so-called "northern perimeter" it will presumably, in the not too distant future, be occupied by a large block of flats.

* * *

R. A. Finch, Sydney, has bred a very unusual Cockatoo hybrid—Leadbeater's \times Bare-eyed. Two young ones left the nest during the last week of November, 1960. They are described as being the size of the Corella parent, with golden colouring under the wings and tail, and having the characteristic Leadbeater's colouring in the crest.

During 1957, 1958, and 1959, the female of a pair of Crowned Pigeons *Goura cristata* at the Berlin Zoo laid an egg at intervals of about three months. Only one incubation attempt was completely successful, in 1959. The young one, a female, was reared to full sexual maturity, laying its first egg when fifteen months old.

There is a full breeding account by Georg and Elisabeth Johst, and a series of six photographs, in *J.f.O.*, **102**, 1961, pp. 88-95.

* * *

Major V. Dilwyn Jones writes of his Salmon-crested Cockatoos : " They laid again this year and all seemed to be going well, but last Sunday (4th June) when I ' peeped ' the two eggs which I had seen previously had both disappeared—as last year. I searched the bottom of the log and this time found a chick, dead, of course ; clearly it had hatched, but did not appear to have been fed. I am glad to say the Citron-crested have a healthy chick about three weeks old."

* * *

According to the *Annual Report of the Royal Zoological Society of Scotland* 1960 was not a good breeding year for the penguin colony : " the reasons suspected being (a) lack of ungutted fish which reduced the vitamin content of the feeding, and (b) unsettling the resident birds by introducing the 1959 contingent of kings, gentoos, and maccaronis which had been undergoing a year's acclimatisation in another enclosure. As the Society has been fortunate in again procuring ungutted fish, and as new and old birds are now happily united, the coming summer should bring a satisfactory number of chicks to the penguin enclosure."

The Night Heron colony continues to increase in numbers and it is estimated there are now approximately fifty descendants of the original six birds that escaped from an aviary in 1936.

* * *

About one hundred members and guests accepted the invitation of the Chairman and Council of the North of England Zoological Society to visit the Zoological Gardens, Chester, on 21st June, 1961.

The Chairman of the Society, Mr. G. B. Groundsell, welcomed the visitors and presided at the lunch. Mr. D. H. S. Risdon thanked the Chairman and Council on behalf of our members. This is the fifth successive year that the Society has been invited to visit Chester Zoo and the warmest thanks of our members are due to the Director-Secretary, Mr. G. S. Mottershead, for making this very enjoyable annual event possible. The weather was perfect, the grounds were at their very best, the birds and animals were, of course, of ever-increasing interest (mention might perhaps be made of the latest arrivals, a pair of Malayan Tapirs), everything possible was done to make the visitors feel welcome. What more could one wish? Yes, we have been invited again for next year.

A. A. P.

REVIEW

INSTRUCTIONS TO YOUNG ORNITHOLOGISTS. BIRD BEHAVIOUR. By DEREK GOODWIN. Museum Press, Ltd. London, 1961. Price 12s. 6d. net.

This second book in the series is a worthy successor to the introductory volume *Bird Biology*, by J. D. Macdonald (reviewed in the Nov./Dec. number 1959 of the *Avicultural Magazine*).

Derek Goodwin has a wide and intimate knowledge of the day-to-day life of birds gained not only by long and careful study in the field, but also on birds he has himself kept in captivity and observations made in zoos and other collections. He presents the subject in a lucid and interesting manner and, as he himself writes in the preface, he has tried to write this book in plain English and to use such special terms ("behaviour students' jargon") only where really necessary. This will be greatly appreciated by those who—the reviewer admits to be one—become somewhat bewildered by the mass of newly coined terms which delight the hearts of so many who write on bird behaviour.

The author not only provides a wealth of information but takes every opportunity to suggest how his readers may obtain additional facts, and the book is undoubtedly an invaluable guide to ornithologists, whether young or old, who wish to study bird behaviour.

All through the book the author demonstrates that bird behaviour is "instinctive" and, in most cases, not even learnt, but there is a hint now and again that he thinks birds may have some perception of what they are doing—a view strongly supported by the reviewer.

The author gives good counsel regarding appropriate human behaviour, particularly with regard to visiting colonies of nesting gulls and terns, and observing roosting birds at night.

This is altogether a delightful book and one that should be bought by all aviculturists, who, alas, all too frequently miss the opportunity of observing the behaviour of their birds.

P. B-S.

* * *

CORRESPONDENCE

INSECT FOOD

With much interest I read the very helpful and practical article titled "Insects and Food Mixtures for Insectivorous Birds". I keep approximately fifty such birds, mainly small and more or less delicate ones. This article contains many splendid suggestions.

One kind of live insect food which the authors do not mention and which I get for the asking, so to say, is the so-called Seedmoth, the scientific name of which I have been unable to locate. This insect breeds freely among the fallen seeds in two sections of my aviary in which I keep Gouldian and European finches. The moth is quite

small and dainty. In the early morning I catch half a hundred or more, taking them off walls and boards. At that time they are quite sluggish, thus easily caught. The temperature in and about the aviary has been rather cool, both daytime and nighttime, yet these moths breed freely. I feed them to Titmice, Flycatchers, and Yuhinas every morning "before breakfast". The birds like these dainty delicacies very much. As seedmoths escape from the finch-section into the softbill-section, occupants of the latter of course help themselves freely to these welcome live morsels.

Perhaps other members have had experience with these tiny moths and can give further relevant information concerning their breeding.

CARL NAETHER.

16759 OTSEGO STREET,
ENCINO,
CALIFORNIA.

THE NATIONAL SHOW

In his letter Mr. Murray suggests that the show cages for Canaries, Budgerigars, and foreign birds are quite in order and suitable for the exhibits. Fair enough, I quite agree. His objection is to the size and colour of British bird show cages and with this I disagree.

A bird which is $4\frac{1}{2}$ to 5 inches in length must not be exhibited in a cage less than 11 by 9 by $4\frac{1}{2}$ inches. This is the size of cage recommended for Siskins, Redpolls, and Goldfinches. The size of the cage for birds such as the Greenfinch and Bullfinch which are themselves approximately 6 inches in length, is 12 by 10 by 5 inches. Compare these with the budgerigar, 8 to $8\frac{1}{2}$ inches in length and whose cage measures 14 by 12 by 6 inches. The Yorkshire Canary: length of bird approximately $6\frac{1}{2}$ or $6\frac{3}{4}$ inches. Size of cage 9 by 6 by 13 inches high. Norwich Canary: 6 inches in length. Size of cage similar to that for Bullfinch. Small foreign waxbills: usually exhibited in pairs. Show cages similar to that of Redpoll.

British and foreign softbills are exhibited in larger cages for reasons which Mr. Murray should well know. If he does not, I will be only too pleased to enlighten him.

Your readers will be able to draw their own conclusions from the above. As for the colour of the interior of British show cages (Aspinalls jade green), this shows up the colour of Goldfinches, Bullfinches, Chaffinches, etc., but does not show the Greenfinch to advantage. On the other hand, the white interior of a Budgerigar show cage, does not do justice to the albino or white, and the white or light coloured foreign birds are not shown to advantage either. I submit that the exhibiting bird fanciers on the whole, whether interested in Budgerigars, Canaries, foreign, or British birds, do show their exhibits in clean and proper cages. As for the "bad old days when shows were held in the back rooms of dubious public houses", Mr. Murray is evidently one who attended, as he seems to know all about them.

A. GREGG.

LINTONHOLME COTTAGE,
BRACKENWELL LANE,
NORTH RIGTON, HUBY, NR. LEEDS.

HARDINESS OF CAIQUES

I was most interested to read Mr. C. M. Payne's article in the AVICULTURAL MAGAZINE (March-April) on the Caiques.

I have a White-bellied Caique (*Pionites leucogaster leucogaster*) which I bought from Mrs. G. T. Clark of Bromsgrove in 1958. The bird was originally in our parrot house where it had heat, but since being kept in an aviary has heat neither summer nor winter and looks very fit and well.

P. H. MAXWELL.

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The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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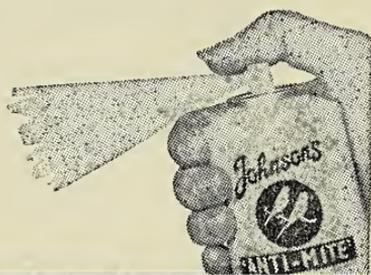
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- Miss E. ADCKOCK, 212 Hagley Road, Edgbaston, Birmingham 16. Proposed by L. W. Hill.
- H. J. BAILEY, 15 Wroxham Gardens, London, N. 11. Proposed by Miss K. Bonner.
- EDMUND B. EBSWORTH, 39 Alma Street, Footscray West, Victoria, Australia. Proposed by A. A. Prestwich.
- BASIL EDE, "Little Gables," Edwin Road, West Horsley, Leatherhead, Surrey. Proposed by J. L. Sears.
- Mrs. H. HALPIN, Box 34, Kilmore, Victoria, Australia. Proposed by Miss K. Bonner.
- Mrs. WILNA HERVEY, Box 37, Bearsville, New York, U.S.A. Proposed by Miss K. Bonner.
- JOHN F. HETTIGER, 2132 Lincoln Avenue, Lawton, Oklahoma, U.S.A. Proposed by A. A. Prestwich.
- Major M. HUGHES-HALLS, P.O. Box 990, Salisbury, Southern Rhodesia. Proposed by A. Lambert.
- Mrs. DORIS INTILE, 308 Franklin Street, Bloomfield, New Jersey, U.S.A. Proposed by Miss K. Bonner.
- J. A. JOHNSON, 32 Lyndhurst Road, West Bromwich, Staffs. Proposed by G. E. Whitmore.
- FERENCE KISS, 453 Grand Avenue, West Trenton, New Jersey, U.S.A. Proposed by C. Everitt.
- JOHN M. MACKENZIE, 56 Providence Road, Morton, Penna., U.S.A. Proposed by A. A. Prestwich.
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- ROBERT L. MILLER, 176 West Wells Street, San Gabriel, Calif., U.S.A. Proposed by Miss K. Bonner.
- E. NORGAARD OLESEN, Janderup, Vestjylland, Denmark. Proposed by A. A. Prestwich.
- GEORGE T. PARSONS, 8630—38th Avenue South, Seattle 8, Washington, U.S.A. Proposed by A. A. Prestwich.
- N. W. SEARLE, P.O. Box 17, Luanshya, N. Rhodesia. Proposed by A. Lambert.

NEW MEMBERS

The twenty-two Candidates for Election in the May-June, 1961, number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

RE-ADMITTED

- ANDREW FAIRBARN, "Findings," High Street, Cranbrook, Kent.
- M. M. SPINKS, "Tetherstones," 55 Doddington Ridge, Wellingborough, Northants.

CHANGES OF ADDRESS

- Mrs. MURIEL M. ADAMSON, to P.O. Box 1064, Warner Robins, Georgia, U.S.A.
- C. BEST, to Rufford Lodge, Rufford, Newark, Notts.
- K. W. DOLTON, "Parklands," Shoulton, Hallow, Nr. Worcester.
- L. GEORGESON, to Housabister, 16 Leys Road, Cambridge.
- G. DE GOEDEREN, to Postjesweg 289 vii, Amsterdam, Holland.
- G. E. HASLER, to "Darlbee," 86 Rowan Crescent, Oxbarn, Wolverhampton.
- WEI-CHING LAO, to Flat C.2, Tsimshatsui Mansion, 7th Floor, Nathan Road, Tsimshatsui, Kowloon, Hong Kong.
- J. W. MIDWINTER, to Quince Cot, Letch Lane, Bourton-on-the-Water, Glos.

DONATIONS
(Coloured Plate Fund)

	£	s.	d.
J. O. D'eath	5	5	0
F. C. Astles	1	0	0
T. Dineen	1	0	0

MEMBERS' ADVERTISEMENTS

The charge for Members' advertisements is THREEPENCE PER WORD. Payment must accompany the advertisement, which must be sent on or before the 15th of the month to A. A. PRESTWICH, 61 CHASE ROAD, OAKWOOD, N. 14. All members of the Society are entitled to use this column, but the Council reserves the right to refuse any advertisements they consider unsuitable.

For Indian Birds buy direct from Baidyanath Acooli, 8/5a Barrackpore Trunk Road, Calcutta 2, India.

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AVICULTURAL MAGAZINE



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THE AVICULTURAL SOCIETY

Founded 1894

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THE AVICULTURAL MAGAZINE

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NORTH ISLAND PIED TIT

AVICULTURAL MAGAZINE

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SEPTEMBER-OCTOBER, 1961

THE NEW ZEALAND PIED TIT

By ALAN R. LONGHURST (Freetown, Sierra Leone, West Africa)

The rather sombre beech and podocarp forests which still cover so large a part of New Zealand are enlivened by two species of the flycatcher genus *Petroica*. These small, alert birds of the ground or shrub layer in heavy forest, have a superficial resemblance to the European robin (*Erithacus*) in shape and movement, but are quite clearly more closely allied to the Muscicapidae. Birds of this and related genera are rather widely spread in the Australasian region and have become specialists in island-hopping, so that a considerable number of isolated island races of several species may be recognized. In New Zealand, the birds may be divided into "tits" (sub-genus *Petroica*) and "robins" (sub-genus *Miro*); the latter bear a very close resemblance indeed to the European Robin but lack its red breast; while the tits are smaller and generally more strikingly marked.

In the North Island, the Pied Tit (*P. macrocephala toitoi*)—which is illustrated on a branch of southern beech—is a common bird of the shrub layer in the native and some exotic forests, while the Robin, which feeds more at ground level, has almost disappeared before the invasion of cats, rats, and stoats and is now only to be found in a few mainland areas and in the island sanctuaries. The writer has a very vivid memory of a pair of Robins feeding, literally around his feet, in the dense coastal forest on the slopes of Kapiti Island. Pied Tits, which are as tame and fearless of man as most New Zealand passerines, may be watched at almost as close quarters in any block of mainland forest. Insect eaters, they are constantly on the move—generally in pairs—now dropping to the ground for an insect, now perching on the side of the trunk of a great podocarp, and may be attracted, even closer to the watcher than they normally approach, by a squeaking noise from the lips or from cork and bottle. It is said that they are at once attracted to the sound of an axe in the forest.

The South Island form (*P. m. macrocephala*) generally known as the

Yellow-breasted Tit differs only in the colour of its breast and in unimportant size differences ; it remains common in most forest areas. On several of the groups of islands off New Zealand geographical races may be recognized which show—as Dr. Fleming has recently demonstrated—some most interesting variations. In the Chatham Island race there is a tendency for the female, drab in the mainland race, to develop the male pattern in its plumage, and this tendency is carried to its conclusion in the Auckland Island race, from far to the south of New Zealand, in which male and female are superficially similar. On the Snares a completely melanistic race occurs.

It seems probable, apparently, that this series of subspecies is very closely related to—and may even be conspecific with—the Australian Scarlet Robin (*P. multicolor*) in which the nominate race has a rich scarlet breast, but is otherwise similar to the New Zealand species, and which itself includes a number of island races which extend from Norfolk Island to the Solomon Islands.

As with most New Zealand passerines, there has been very little detailed study of the behaviour and ecology of these birds, though much very fine work has been done on various sea birds in the country. Perhaps some day an explanation will be given of a very curious habit of the male of the pair of Robins watched at arms length on Kapiti. It was feeding on the ground, among a litter of dry leaves which were hunted quite systematically and below which insects appeared to be detected, probably by sounds. At frequent and regular intervals the bird would perch on a dry twig, or the main rib of a large dead leaf, and putting its weight on one leg would vibrate the other foot so that its outline was blurred and a hissing, rustling noise was produced—but so soft that only the nearness of the bird made it audible. Was the noise deliberate or accidental, and is this a normal feature of Robin feeding activities ? Could such a sound induce insects to move and give away their positions and, if so, does the habit occur in any other birds ?

* * *

THE BREEDING OF THE BRITISH STONECHAT

(Saxicola torquata hibernans)

By the Rev. J. R. LOWE (Coln St. Aldwyns, Glos., England)

During the autumn of 1960 a hand-reared pair of young Stonechats were received and wintered indoors with no heat throughout the winter. They were very tame and took mealworms, etc., from my fingers. At the end of February the birds were put out into a planted aviary 36 ft. × 36 ft. × 6 ft. 6 in., with a double-compartment, old pigeon loft as an indoor shelter.

On 25th March the cock Stonechat was noticed in display and occasionally chasing the hen. The display was interesting, as in so many courtship displays, the bird altered his whole contour and changed from a rather chubby little bird to one that was long and thin, the head thrown up, the tail flicking, all the white areas, such as white collar and white wing-coverts appeared continuous, and white rump much in evidence. This was accompanied by a curious slow butterfly flight from one part of aviary to the other and a good deal of loud clicking from the cock. The hen appeared rather indifferent to this activity. At this time the cock produced a more attractive little warbling song. On 26th March the hen had a dead leaf in her beak, though I couldn't believe she was really building; between 26th March and 2nd April we had discovered the nesting site, about 2 ft. 6 in. up in a tightly clipped *Lonicera nitida* bush close to the aviary wire. A tremendous foundation of leaves and sticks and dried stalks and dead grass was first laid and the cup of the nest began to be fashioned and lined on 6th April. Lining continued on 7th April, a few feathers were used but moss and dead grass formed most of the lining. The hen did all the building; once or twice the cock picked something up and while the hen was on the nest took it to her and for a minute or two both were inside the bush, but the cock was inside only for that brief time. On 8th, 9th, and 10th April both visited the nest, cock sometimes calling hen to visit the nest, which was complete and not added to as far as one could observe after 7th April, so that the nest was completed in 13 days. On the evening of the 10th the hen looked a bit thick and on the morning of 11th April there was one egg. Both birds were still ridiculously tame and still took mealworms from anyone who cared to offer them and the hen, all through her building activities, never turned a feather, no matter how close people were to the nest. Five eggs were laid. The birds were not seen to pair.

On the evening of 28th April the cock met me in the shelter compartment with a newly hatched Stonechat in his beak! He flew down at my feet and laid the baby on the floor. It kicked slightly and I picked it up, warmed it in my mouth, and transferred it to the nest: the

mother grumbled slightly, but received it without leaving the nest and shuffled it and her eggs like an old hen ; I fled from the aviary, wondering if I ought to remove the cock. On 29th April a quick look at the nest when the hen was off revealed two tiny open mouths and two eggs. I felt a little better, but wondered about the fifth egg. Was the chick I rescued the first victim, or the second ? Had the cock poured two babies out with the bath water, or only one ? Was this nest cleaning gone sadly awry ? Was a baby mistaken for an egg shell ? He never made the mistake again.

30th April. There was one chick and two eggs. The nestling appeared healthy and down looked dry, and growth was considerable even in twenty-four hours. The chick continued to grow rapidly. I was rather worried about food as ants' eggs were scarce and insect life in the aviary not abundant, despite a fairly liberal heap of manure in one corner. The weather was rather dry. Maggots were not used in feeding and the main diet of baby was cut-up mealworms ; soft-bill food and hard-boiled egg was always available. On the eighth day I put a closed ring on the baby.

On 10th May the hen met me carrying building material ! My heart sank ; the nest was empty and was being redecorated. Under the bush was the baby, dead but an hour or two, and the two infertile eggs. I could have wept. On 15th May there were three new eggs in the old nest, and two more appeared. All the eggs were very round, a pale greenish-blue, with faint reddish spots at one end.

On 30th May a chick hatched and did well, other four eggs infertile. Ringed on the eighth day, it was turned out of the nest on the ninth day. My cup was full ! A friend had sent a big box of wood-ant eggs, accompanied by a considerable number of highly indignant wood ants, and the second Stonechat baby had done even better than the first. Was it the ringing that had caused this hideous infanticide ? Was it possible that in the first case the hen had come into breeding condition too quickly a second time, because with only one chick to feed she hadn't enough to do ? The cock did most of the feeding after the first few days and nearly all the nest cleaning. There must be a big difference in looking after one nestling instead of five and often six ?

On 16th June I discovered that the hen Stonechat had decided to have a third go. She had chosen an old coco-nut husk, about 5 feet from the ground, and had laid as far as I could see three or four eggs. Not very much of a nest, just a little lining of dry bents. Five eggs were laid ; and I decided no more beastly closed rings. Anyhow I could not have got at the babies to ring them.

To cut this third story short, on 14th and 15th July three young Stonechats left the nest and have continued to do brilliantly to date, 14th August. They were reared for the first week largely on wood-ant eggs, which they shared with a family of young Goldfinches that were

hatched about the same time in the same aviary, and with meal-worms *ad lib.*

The old pair of Stonechats are now in a heavy moult. The babies (a cock and two hens) are in a separate aviary, looking very sleek and reasonably tame. They have been persuaded to take maggots and large quantities of earwigs, caught in pots near the dahlias. So ends this saga, and we wonder how often Stonechats have been bred in captivity before.

The latest acquisition is a pair of Goldcrests, hand-reared. The most charming birds I have ever had. Embarrassingly friendly and prefer one's company to one's absence, which could make one conceited. They have now got their crests and are, I think, a pair. The cock has been actually going through a form of display and singing as I have been writing; I begin to wonder if he does not get too rough at times and I may have to put a partition in their cage. But they are the most delightful of all the British softbills that I have ever had. It seems amazing that at so early an age the cock should be in display with gold crest erect and tail fanned out and wings dropped. We hope to persuade them to go to nest next spring.

Cockatiels and Dwarf Ruddy Ground Doves have been reasonably prolific this season.

* * *

EXPERIENCES WITH LIBERTY BUDGERIGARS

By E. L. TAYLOR (Guildford, Surrey, England)

To provide the pleasure of watching birds in flight is a branch of aviculture that makes its own appeal, falconry doubtless affording the finest spectacle. I can well understand the obsession of Frederik II of Hohenstaufen who, in the thirteenth century built palaces for his falcons and, whilst making history for Europe, wrote (by his own hand) a long and interesting account of this sport of kings.* In our age of spreading populations, more numerous and mobile than ever before, it is too difficult to secure the hawks and to find the necessary space; on which account we must be content with fowl of humbler kind. For my own part it is high-flying tippler Pigeons and liberty Budgerigars—and I do not apologize for the implied comparison with Goshawks and Peregrines.

Although I know the subject to be taboo in the AVICULTURAL MAGAZINE I should like to make one brief reference (for the purpose of illustration only) to those high-flying tipplers that I find so interesting; birds completely under my control, that can be released at will and watched, by the naked eye or through binoculars, as they mount higher

* *The Art of Falconry, being the De Arte Verandi Cum Avibus of Frederik II of Hohenstaufen.* Translated and edited by Casey A. Wood and F. Marjorie Fyfe. Stanford University Press. Reprinted 1955.

and higher, until sometimes they enter clouds, or are out of sight in the blue sky. To know those birds as individuals, that only an hour ago were held in one's hand, who's young are in the nest, with their feathers just beginning to burst from the quill ; to watch their enjoyment in the air is to enjoy flying oneself. One cannot be quite so intimate with Budgerigars, but one can have these lively birds under some control at least, and produce in one's own garden a most excellent display of avian aerobatics.

I am not versed in the history of the art of keeping birds at liberty : I suppose the Duke of Bedford to have been the first to work out a *system* of managing Budgerigars in this way, although I should be interested to know how much of it was original, and how much had already been practised with other kinds of cage birds, perhaps for hundreds of years. Of course I studied his method with care. It is well explained in his excellent little book, which, however describes rather grandiose accommodation, and savours here and there of a past age.*

The starting point of my experience was the acceptance of five Budgerigars as a gift from the village decorator. There were three green and two blue, of a very ordinary kind and to these I added seven others, two "yellow-winged greens", two "white-winged blues", two "cobalts" and a "white". They were all of the cheapest procurable, and I made no attempt to secure so-called "homing Budgerigars", considering it unlikely that such a character could, as yet, have become fixed in any strain.

Indoor accommodation was quickly constructed in part of a large shed, and during that winter I erected the flight outside. It was of very modest proportions compared with the one recommended in the guide book, 7 feet high, 7 feet wide and 13 feet long. I also constructed a number of nest-boxes, in readiness for the proposed increase of stock during the next two seasons, as it was my intention to build up towards one hundred birds before release in 1958.

1957

The first season was a failure, owing to my lack of understanding of the psitticine mentality. It was not that my architectural potentialities were at fault, rather than that my dwellings were too desirable. Some of the designs made a tremendous appeal, but in so doing aroused the envious nature of the Budgerigar hens. I was amazed to find the savagery that lay deep down in the character of those little birds. It was made clear to me that if a Budgerigar really wants something that belongs to another, and murder is the most direct way of getting it, then murder it is. Eggs were thrown out, young birds similarly disposed of, and even adult hens done to death in their own bed chambers.

* "Homing Budgerigars" by The Duke of Bedford. Published by *Cage Birds*.

The persistence of the aggressors was both painful and wonderful to behold. There was no cessation until an entrance had been forced and the awful work had been completed.

1958

In preparation for this second year, therefore, I erected a "slum", a long hollow tube, square in cross section and partitioned into twenty dwellings, separated from one another by thin asbestos walls; with identical front entrances and identical back doors—also of asbestos. The door latches were identical and the floors were standard floors; the only way to differentiate between one and another was by the numbers that were painted in plain standard figures on the front and on the back. I destroyed the distinguished architecture—the houses of character—and calm returned to the commune. Of course infanticide,

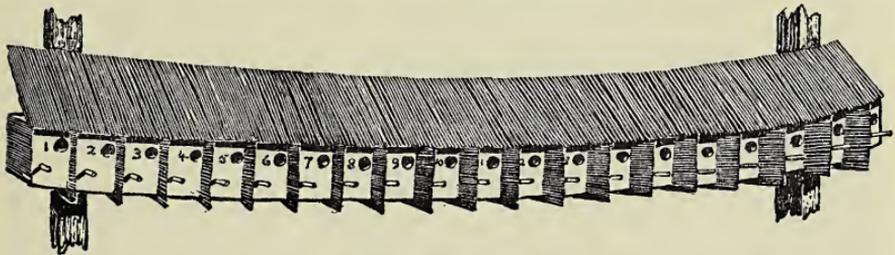


FIG. 1.—Row houses for budgerigars.

and ovo-infanticide continued to a certain extent, some of the hens still being activated by envy of another's family—envy seems to be the besetting sin of the Budgerigar—but it was not now the expected end of eggs and young, and before the summer was over there had been a three-fold increase.

Although the numbers were still not quite what I thought they ought to be before venturing to let the birds fly out, I decided to start in the following season, whether Budgerigars seemed to be sufficiently numerous or not. During that winter I constructed the ladder exit and the lobster-pot entrance hole, as described by the Duke of Bedford.

1959

At last, on a fine and calm Saturday morning in April, I opened the door at the top of the ladder that led to the open air of a large garden, with many trees, and rural surroundings, where there is no confusion of similarity of human dwellings and of gardens. There were now between thirty and forty Budgerigars in all, and I watched several of the more venturesome climb up the ladder and fly away in obvious glee. Perhaps a dozen went out at this time and flew swiftly around in a magnificent aerobatic display. Their skill on the wing was even better than I had supposed it to be, and their delight in the newly-found freedom was a pleasure to behold—but they did not return.

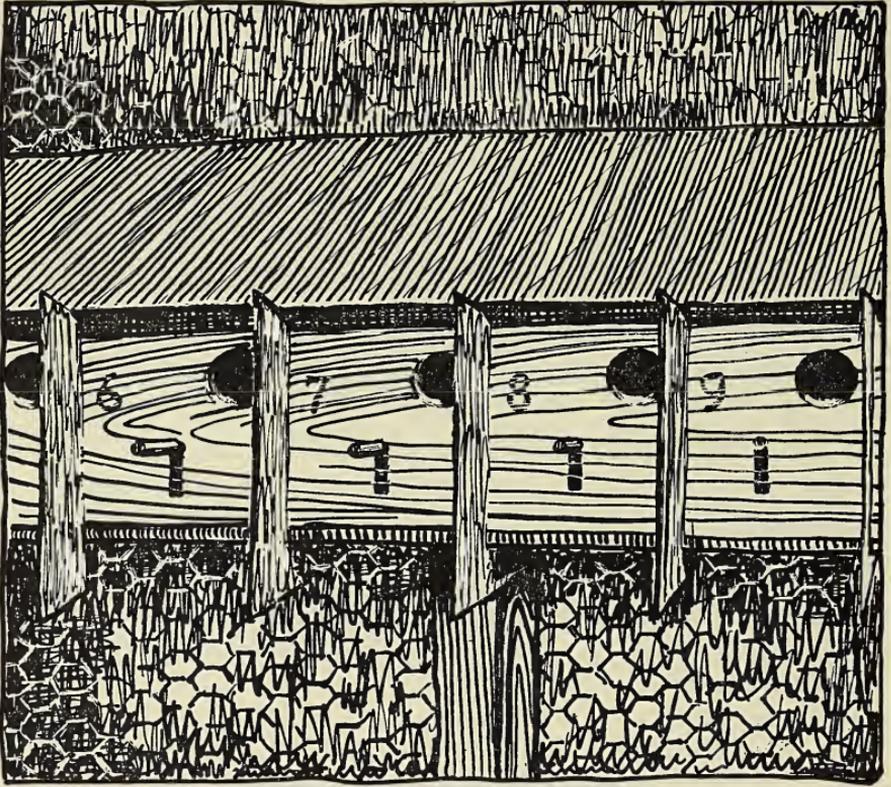


FIG. 2.—Front entrance of Budgerigar row houses.

Now and again I saw one fly across the garden, often high in the air, but without appearing to recognize the place where it belonged. One or two did eventually find the way into the flight, but it seemed only by chance that they happened to be near their home, where they saw the other Budgerigars, and ultimately found the way in.

This first trial of the Duke of Bedford's method seemed, therefore, almost a complete failure, and I was very disappointed. Clearly something else must be done, or I should lose the lot. As it was, I had lost 80 per cent, or 90 per cent of those that I had allowed to go out, and a halt was called while new methods were considered.

For this purpose it seemed wise to invoke the scientific approach and start from first principles. I perceived that the problem that faced me was an educational one, of perception, recollection and facilitation. The senses through which the appeal had to be made were those of hearing and of sight. Although in no way melodious these birds are at least vocal—so I reflected—they might even be considered vociferous. I concluded that they must have a language, of a sort, not for the communication of information, but a mere *talk* for the maintenance of contact, and continued assurance of good fellowship—as of washerwomen at work, or of school girls on a picnic. How could I use this

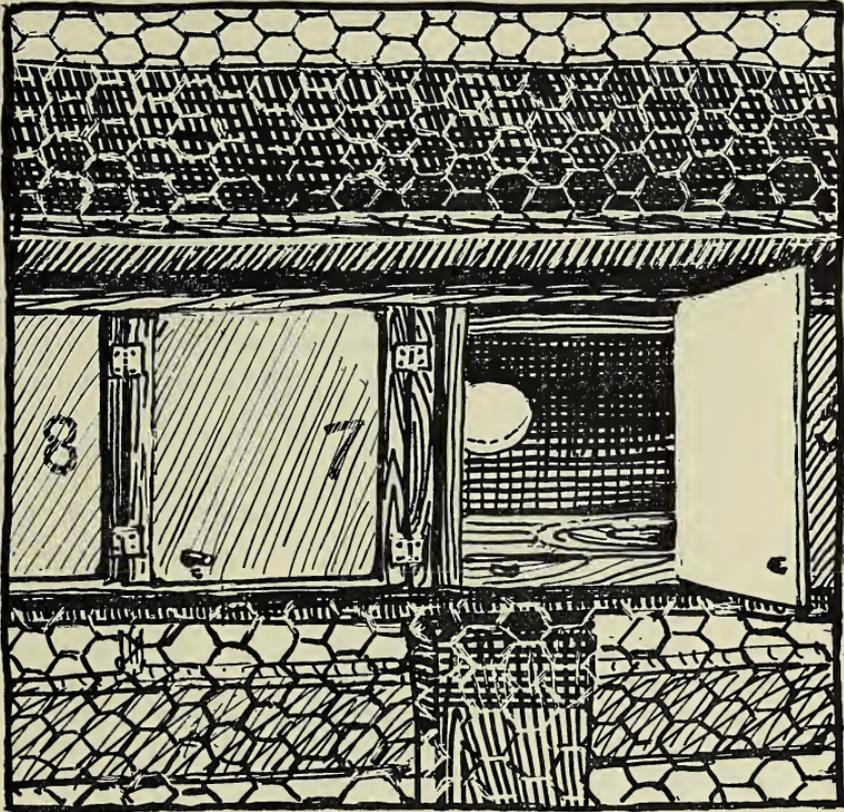


FIG. 3.—Back doors of Budgerigar row houses, accessible from outside the flight.

to bring birds home? Had the technologists produced any recent developments that might help? These were the lines along which my thoughts ran, and it so happened that my boy Jan had recently bought a tape-recorder, why not, (I thought), make use of this modern equipment to amplify the normal chatter? Better still, why not make the birds say something appropriate, record that, and then reproduce it very loudly?

Acting on this idea I bought a reel of tape, borrowed Jan's recorder and proceeded in the following way to elicit the calls that seemed best suited to the purpose of bringing lost Budgerigars back to their home.

It is a most commendable arrangement in the Budgerigar community that the hens shall stay indoors to sit on eggs and tend the very young, and free the cocks to carry on with little flirtations, to enjoy the open air and at night to repair to a comfortable shelter, a sort of club, away from the hens, where, after a little more talk they can go to sleep, looking forward to the beginning of another pleasant day. Nothing was easier, therefore, than for me to go down there after dark and to close the little door between the shelter and the flight, where the hens were, in the nest-boxes, with eggs and young. I found that if this were

done, and the two groups were kept apart, on the following morning, they made an increasingly loud and anxious noise for two, three or four hours. Translated into human tongue it would represent the continuous shouting of the following words and phrases:—"Where are you?"—"Come here"—"I want you"—"Come quickly"—"Please come now". And later on in the morning:—"Help!"—"I'm starving"—"Wherever are you?"—"We're all starving"—"Come at once"—"Help! Help!". This kind of calling went on with increasing emphasis, and, one may suppose, with mounting tonal quality of anxiety such as human ears may be unable to detect, but that might nevertheless be recorded and amplified by a tape recorder.

A temporary family separation was therefore brought about, and when the wailing had reached a very high pitch I made a 35-minute recording before opening the door between the flight and the shelter, and permitting the reunion so long over due. The recording was vetted by Jan, who had pronounced it "reasonably good" (he would never admit to perfection) and on the following day I made another essay with liberty Budgerigars.

As at the previous trial, perhaps a dozen soon found the ladder and without hesitation made use of their wings for the exploration of the unknown. It was quite clear, from the elevation at which some of them flew, that it was no mere matter of hopping from bush to bush; they really meant to go places. On this account I soon began to worry again about their return, and went down to close the outlet door. As I did so there were Budgerigars to be heard in near trees and in distant trees; I saw them streaking through the garden, or flying higher than the tallest of the trees, but they seemed to have no idea of coming to inspect the home with which they were so familiar, on the inside.

The recorder was standing in readiness in the open window of the shed, so I started its loud reproduction of the agonized calls of isolated Budgerigars. It would be doing myself less than justice if it were not mentioned here that I did not *expect* to see Budgerigars converging from near and far at every point of the compass, but I must admit to having been a little disappointed that the effect was not more marked than it actually was. All I can honestly report is that it certainly did operate to a relative degree. On three occasions, late in the day, when lost Budgerigars were seen or heard in willows or in apple trees I ran down the garden to switch on the recording, and on two of those occasions saw the birds almost immediately take notice and fly towards the sound, so finding their way in.

Taking stock, after this trial I had to conclude that the use of modern equipment had not been successful. I had lost another eight or ten birds, one or two nests of young ones had perished in consequence, and in general it had been an unhappy experience. Education through amplified Budgerigar talk was not a feasible proposition and it was

clear that I must think again. It even occurred to me that I might have made a fool of myself in front of the avian world ; perhaps the language that I had amplified so greatly was abusive ? If so, then what a story for Sparrows to laugh at !

1960

One hope still remained, and since the application of the method ought to have been so obvious to me I can only blame myself for not having used it and been successful in the first place. Pigeons are the best and most reliable of all liberty birds, yet even *Columba livia* needs a little education about the *appearance of home from the outside*. At one time I used to lose a number of young pigeons when first they were allowed out of the loft. They would take off from their well-known and well-loved home, never to return, and this simply because they had never been taught to recognize it from the outside; in fact they had never seen that view at all.

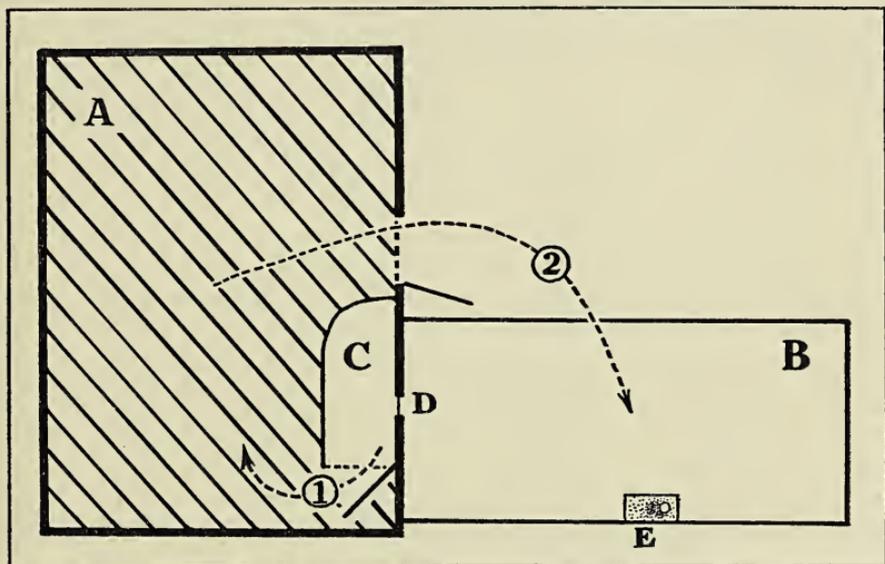


FIG. 4.—Plan, showing the direction taken by birds from their indoor shelter to the flight. A—shed, B—flight, C—shelter, D—Budgerigar doorway (closed), E—entrance to flight and food tray, 1—escape into shed, 2—escape through window.

The education of my pigeons has latterly been effected in three stages, (a) to get to know the inside of the home, where there is food and safety, (b) to learn the way into it from confinement in a wire-netting cage immediately outside the entrance door, and (c) to learn what home looks like from the outside. This last item of education is effected through placing the pigeon in a cage away from its home. The cage must be adequately large for its composure so that it may quietly exercise the mental process of perceiving the appearance of its home.

The young birds are confined in this way for a day at a time in each of three or four parts of the garden from where the loft may be seen. At the end of each day, when they are both hungry and thirsty, I place them in the wire-netting cage immediately outside the entrance door, from where they must make their own way in to find the food and water. This they are very anxious to do, and since following this procedure I have only lost one newly-acquired adult, and not any of the young ones.

But how could I apply this method to Budgerigars? That was a different question. To receive impressions of the outward appearance of their flight they must be in a sufficiently composed state; and that, I considered, could hardly be expected after the flurry of a catching do, or in the crowded conditions of a portable cage. I then wondered if I could employ a part, only, of the "training course for pigeons", and while thinking of this possibility it occurred to me that those Budgerigars which I had lost had been full-fed at the time of release, and so went off without a care to explore the wonders of a new world. Suppose they had been very hungry, might not they then have been anxious to find food rather than to take exercise?

Out of this came the idea of closing the doorway between shed and flight at night, when all the cocks and many of the young birds were roosting indoors; keeping them there without food or water until late on the following morning. Then, when they were very anxious indeed, the hens in the flight shouting their heads off and the cocks in the roost ravenously hungry, to release the cocks, *not* through the little Budgerigar doorway leading to the flight, but through the ordinary door that I used myself, leading to the main part of the shed. If the window were widely open on the flight side the birds would escape that way into the garden, and, hearing the loud calling of the hens, would fly onto the top of the flight, see the food, and exert their utmost endeavours to get in.

Everything was now carefully prepared for the new trial. A few things were tidied away in the shed and one or two stray branches lopped from the dogwood bushes outside, to give an unobstructed view of the flight from the shed window. In the end I was satisfied that every encouragement would be given for avian emotions and desires to operate towards the wished-for end. I decided on boldness. I would procrastinate no longer with timid trials, but would make all those who slept indoors that night find their way from the roost to the flight, where their breakfast was so obviously ready and the hens so anxiously waiting. I only waited now for the weekend when I should be at home and could endeavour to cope with unexpected eventualities.

On the evening of Friday, therefore, the outlet to the flight was closed, and on the Saturday morning the birds found themselves unable to make the usual exit into the flight. By 9 o'clock there was

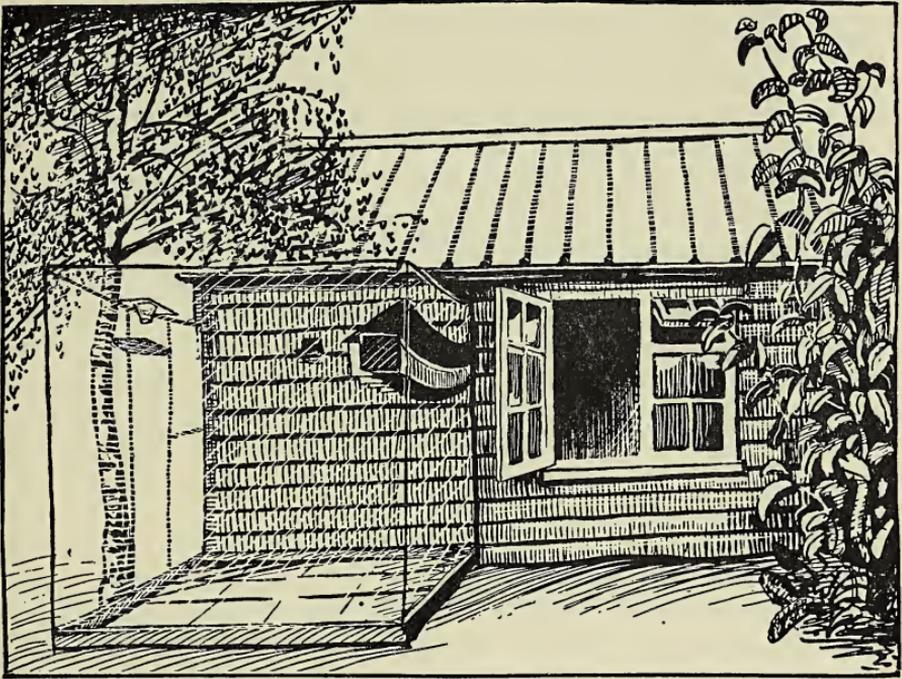


FIG. 5.—General view of the flight, showing the birch tree over the entrance hole, and the open window of the shed.

considerable hubbub ; by 10 o'clock there was shouting ; by 11 o'clock most of the hens were out of their nest-boxes, shouting as loudly as they could, and by 11.30 the whole place was in an uproar, at both sides of the Budgerigar doorway. They were indeed now thoroughly well attuned, and conditioned to make the required response ; so I opened the half-door that leads into the shed, opened widely the window at the back of the flight leading to the garden and retired to a distance to watch the result. Several minutes passed before the first birds began to make their appearance, flying straight out through the open window as though to fly right away. The isolation and the fasting had, however, sharpened their senses and, in consequence, they made a response to the calling of the hens by an immediate halt in their career and a descent onto the top of the flight. Once there nothing could have been more inviting than the food so obviously displayed ; their one aim was to get to it quickly ; they found the entrance hole immediately over the food tray and they entered.

I am sure the behaviourists would have some special term for the maximum effect that was achieved. "Magnetic" is a word that might apply. It was like opposite poles attracting ; there were empty crops and a tray full of food ; there was desperate loneliness and a wifely welcome, a sight for hungry eyes and a sound to calm distraction.

I cannot say that the Budgerigars stood in a queue, or that they actually poured down the lobster-pot entrance, but almost so. They only had to discover the detail for themselves, everything else had been laid on, and the percentage efficiency must have been very high indeed.

At the end of the day I concluded that the trial had been very successful. It had been a good first lesson for the education of my Budgerigars in the art of homing, so that they now knew something of the outside appearance of their flight and of how to make their way in. I thought it still unsafe, however, to release them, full-fed, into the open, and decided that they must have further lessons of a like kind before their education had been completed. The whole process was therefore repeated twice more, and I was pleased to notice on each occasion an increase in the purposeful nature of their responses. This was the process of "facilitation" already referred to, the final part of their educational course.

Present Position

The ultimate outcome is that we now have a scene from a tropical clime in the cool comfort of a Surrey garden. The house stands on a sloping bank, some 35 yards away from a stream that is lined by tall willows. Under these pleasant trees is level ground that is too wet to cultivate and is allowed to pass through its own succession of the floral year: marigolds are followed by foxtail, which introduces the buttercups, then comes ragged robin with pink-tipped Yorkshire fog, and latterly, meadow-sweet, loosestrife and the great hairy willow herb. All are under partial control so that no one kind is allowed to take complete possession for itself—nor nettles to invade.

In June and July it has a brilliance of green that is unsurpassed and as the evening breeze turns up the silver side of the willow leaves and the low sun lights the blue-grey of their trunks and boughs it is a cool and colourful haven of succulent growth, a place for sun-scorched Bedouins to dream of. Three strange birds appear as we look down from the bank above. They fly swiftly across the level bottom and up into the willows. One of them is blue, bluer than the Kingfishers that frequent the stream, a second is greener than the grass below, and the third is white. Soon afterwards another blue one appears from nowhere, flying steeply down, in a power dive that brings him to within a yard of the ground; he then makes a miraculous turn and shoots like a rocket over the top of the tallest willow tree, to appear again almost immediately, at the side of the tree. He must have made two turns with extraordinary dexterity to have reappeared so quickly, flying towards the birch tree that is over the inlet to the flight, where he joins the chattering group already there. It is clear that he is a young bird, enjoying the power of wings and the skill with which he can make use of them.

Later on a group of five fly through the garden and two others, a dark green and a light green are seen in a rapid chase round a small hazel tree. They dive over the ridge of the shed clearing it by two or three inches only, then make an impossibly quick change of direction and again finish in the birch tree over the entrance hole. Presumably these also are young birds, to find it worth while expending effort so unnecessarily. The tree over the entrance hole is the favourite where I have counted up to eighteen birds at one time. Some seem to spend most of their day there, and others find a particular pleasure in climbing up the ladder to go out and then, soon afterwards, climbing in again. This is repeated at intervals throughout the day, with only short flights and brief visits to other trees.

There are, of course, other ways of keeping Budgerigars at liberty. To place nesting-boxes in the garden is one that has the advantage of cock birds that may continually be seen trafficking with food from hopper to nest box ; the disadvantage is that of losing most of the fledglings. One of my acquaintances merely throws the Budgerigar house open in the spring of the year, come what may. Sparrows welcome this as a sign of weakness in their enemy man ; so they make free, usurping the homes of their betters, grabbing the best of the food and desecrating the nest boxes with abominations of straw in order that their own misbegotten and impudent brats may be reared in luxury.

My short experience has convinced me that the Duke of Bedford's advice is sound ; Budgerigars need a certain amount of discipline. If too much freedom is allowed, so that they come out full-fed late in the evening, they are apt to spend the night out ; at first they only do this occasionally, but later it becomes a bad habit. As they become increasingly familiar with more distant trees they get ideas of still wider exploration, losing all sense of the security of a particular home, and forgetting their responsibility to the community to which they belong. This is a process of demoralization of liberty Budgerigars such as, in my opinion should not be tolerated.

On this account I have designed a clockwork apparatus whereby weights fall and levers move to bring about a morning release at 10.30 and a closing of the door again at 5.00 in the evening, after which all late-comers must use the lobster-pot opening and stay indoors when once they have re-entered. I also plan separate winter accommodation for cocks and hens, and a trap for catching them whenever they must be handled for any purpose—There is no end to these affairs !

NOTES ON KEEPING THE WHITE-HEADED DUCK (*Oxyura leucocephala*) IN CAPTIVITY

By DON ALBERTO DURÁN, Director Parque Zoológico,
Jerez de la Frontera, Spain

Two ducklings were received from Las Nuevas, in the marismas of the Guadalquivir, one on 30th July and the second on 7th August, 1960. The sex was not known. We fed them on minced spinach, beet or lettuce, wheat, rice, minced liver or meat, and shrimps or minced fish. The food was thrown into the pool because they would not take food that was not right in the water. We tried placing the pen below the edge of the pool with water and food in it but they would not take it.

From 30th July to 5th August the water was changed every day without cleaning the bottom of the pool but from then on the pool was cleaned every week and the water changed daily. The food was taken from the bottom and sides of the pool but always under the water. The green vegetables which remained on the surface were also taken. The birds were very fond of liver.

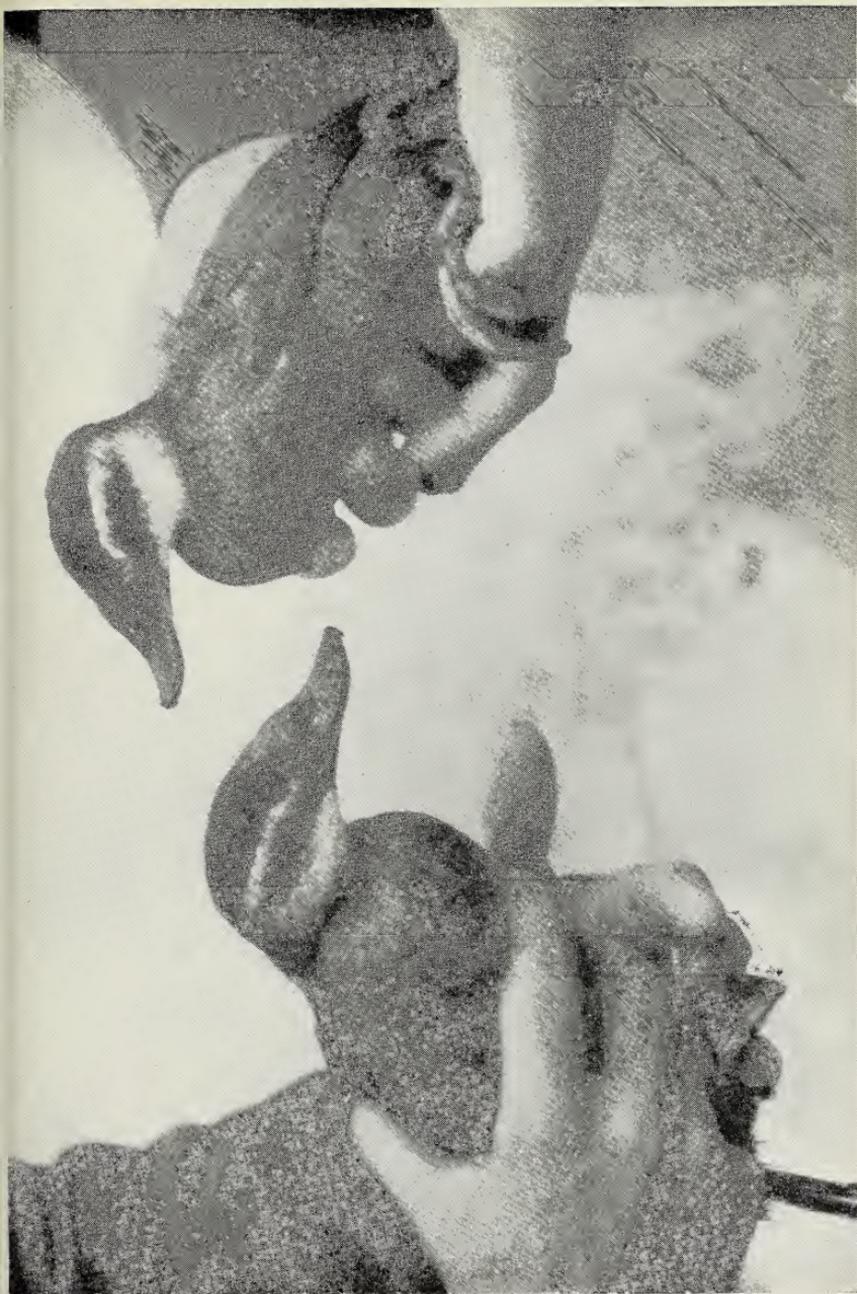
From 21st August soluble blue Cobial, a vitamin compound of vitamin A + B₂ + pantothenic acid + Colina was put in the water. At the same time we began to give them aureomycin (Chlorotetracycline unrefined, soluble), dissolved in water, once a week.

On 28th August they appeared to become "draggled" by being in the water. A few days after starting to give them the vitamins and aureomycin and cleaning the bottom of the pool this condition cleared up and from then on they were in completely normal plumage, that is to say the appearance of being "draggled" disappeared.

During the day they spent very little time in the water. They preferred to feed during the night, from midnight to four in the morning.

On the 18th October the bird which was received last showed lameness which prevented it from putting the right foot to the ground. On examination of both birds it was found that they had some abscesses in the joints of the feet, some already formed and others in course of development. On 21st October treatment was begun with injections of avian "Covapen E" based on streptomycin; 0.40 cc. of this product was given to each bird for three days, and repeated after an interval of four days. This treatment was continued until 4th November when they had their last injection. The abscesses had completely disappeared and since then have not recurred.

The birds are rather quarrelsome, the second, received on 7th August, dominating the other.



[Alberto Durán

WHITE-HEADED DUCK (*Oxyura leucocephala*)

Two ducklings in the Zoological Park, Jerez de la Frontera, Spain

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They were first weighed on 18th August and every week since then ; the following is the record of their weights :—

	<i>The first bird</i> (received on 30th July)	<i>The second bird</i> (received on 7th August)
	<i>Grammes</i>	<i>Grammes</i>
Aug. 18—	380	380
25—	380	370
Sept. 1—	380	380
8—	420	380
15—	460	380
22—	460	380
30—	460	380
Oct. 6—	480	400
13—	480	420
19—	500	410
27—	520	460
Nov. 10—	480	430
17—	500	440
24—	540	500
Dec. 15—	620	540

Special mention must be made of the interest and competence of our technical staff—the curator Senor Lassaletta and the veterinarian Senor Valverde, thanks to whom we have been able to keep these specimens alive in captivity, whereas previously they have died within two or three days of being captured.

* * *

The following note has been received from J. J. Yealland :—

The White-headed Duck ranges from southern Europe to north Africa and eastward to parts of central Asia, some populations being sedentary and others moving southward for the winter to Egypt, south-eastern Caspian Sea, Iraq and northern parts of India. It is a bird that appears to prefer brackish or even salt water to fresh. According to "The Birds of the U.S.S.R." the Savkah, as it is known in Russia, nests among reeds and rushes, sometimes making use of old nests of Grebes, Coots and Pochards. Six eggs are said to be the normal clutch, though as many as thirteen (possibly laid by more than one bird) have been recorded. There is a record of an incubated egg being taken from a nest near Astrakhan and left in an unheated room for a week whereupon it hatched. The food is said to consist largely of plant matter (seeds and foliage) ; larvae of flies and other insect life, molluscs and crustaceans also being eaten.

* * *

THE BREEDING OF THE SOUTH AFRICAN STONE-CURLEW

By J. W. W. LOUWMAN (Wassenaar, Holland)

In June, 1958, Wassenaar Zoo received two South African Stone-Curlews. The birds were placed in one of the large central aviaries of the Louise Hall, the bird-hall of Wassenaar Zoo, where they lived together with several species of exotic pigeons, such as Australian Crested Pigeons, Bleeding-heart Pigeons, Barbary Doves, and others. The aviary is planted with oaks, beeches, several coniferous trees, and some shrubs. It is about 17 feet high and has an area of approximately 25 by 30 feet. The climate of the Louise Hall is to some extent subtropical; the whole building being chiefly a glass construction, temperature at day-time rises quickly, but drops equally quickly at night. In winter, in spite of the fact that only the side aviaries are slightly heated, it is very rarely that the temperature drops below zero C. The soil of the aviary is mainly sandy and the Stone-Curlews did very well there, but we were not quite sure whether they would turn out to be a true pair or not.

At the end of March, 1960, however, they started making a nesting mound on the ground, which they placed with one side against a small shrub (*Ligustrum ovalifolium*). Saying they built a nest is giving them rather too much credit, because what they actually did was to make a small hollow and bring there some pieces of shell and an occasional twig. On a later occasion, when they built a nest in September, they used the leaves of a beech tree as nesting material. The first eggs were laid on 2nd and 4th April, but no more followed. The eggs had the characteristic colouring, i.e. dark-brown spots and patches on a light-brown general colour, but there was a decided difference between the two, the second egg being lighter in colour than the first one. As we did not want to disturb the birds, we did not measure the eggs (photograph 1). After two weeks of brooding, one egg was miraculously gone one morning and no remains were found. Of course we had to enter the aviary every day and it was remarkable to see the attitude of the two birds. Whichever bird was sitting on the nest remained there as long as it possibly dared, but the other bird immediately attacked, or at least put on a threatening attitude. When staging these vague attacks the bird muttered excitedly in a low voice. It is not easy to describe the sound they made, but it was easily understood that it was meant to frighten us away from the nest.

On 26th April one young one was born (photograph 2). It was almost invisible on the soil, being mainly sand-coloured with a few dark patches on its back and head.



1. The first two eggs were laid with an interval of two days, the last one of which disappeared without a trace after two weeks.



2. The young bird was born on 26th April and showed a sandy colour with dark patches on head and back.

[To face p. 162



3. It was taken out for a walk after three weeks and came running to me whenever I whistled an imitation of its own call.



4. Past the stage of being hand-fed it could soon defend itself against other birds such as the European Roller as seen in this photograph.

How very effectively this protective colour is used was best demonstrated when the bird reacted to a warning call or another noise that made it afraid. In that case the little bird made itself very flat, putting its head and neck on the ground and lying quite still.

The breeding of birds and especially of those which do not have the protection of a solid nest, is always a hazardous affair. Dangerous enemies are to be found practically everywhere. The birds at the Zoo are, of course, better off, but breeding in an aviary with a mixed population still requires some precautions. The birds need not fear an attack from the pigeons and doves in the same aviary. They were as a matter of fact far too aggressive to allow any of these inhabitants to come near the nest of the young bird, but in the neighbouring aviaries there were already some interested spectators: African Red-billed Hornbills (*Lophoceros erythrorhynchus*) on one side and Kookaburras (*Dacelo gigas*) and several Jays on the other side. The wire netting was perfectly all right for the adult birds, but for so small a youngster there was definitely danger ahead. Something had to be done, but putting in narrow wire meshing disturbed the adult birds so much that they started to trample on the youngster and even began to snap at it. When we came to the rescue our first impression was that we were too late. When I took the bird it was quite limp and only after I tried to take a photograph in its natural hiding posture, I noticed that it was still alive, though probably unconscious. Immediately I took it home with me and put it under a thermal lamp in one of my terrariums. At that time I did not expect it to recover, but soon after it was on its feet again and quite happy. So far so good, but how to feed a young Stone-Curlew. The next day it refused all food except for a few mealworms, but soon thereafter it took earthworms, flies, balls of minced meat, etc. Additional ingredients were hard-boiled eggs, ground dried shrimps (after softening), but except for live insects, worms, etc., it did not take one bit of food unless I put it on a saucer right in front of it piece by piece. I had to put every bit of meat and shrimp and every half-dead fly before it to make it eat. In this manner it was fed all the day through from morning till late at night.

Except for the muttering scolding voice of attack, we never heard a sound from the adult birds, but the young one often uttered a squeaking tone, rather high and resembling the noise a badly greased barrow-wheel makes. I heard this noise all day through whether I was in the room or not and also often in the late evening hours.

A terrarium is not exactly the place where one generally puts birds and this one, only measuring about 2 feet long and $1\frac{1}{2}$ feet wide, was certainly not a proper place to keep a Stone-Curlew.

This is why, when I was in the room, I took it out and allowed it to walk through the room at liberty. When a week or two old I also took it outside with me and as soon as I made the squeaking noise I was used

to making as an imitation of its own call it always started to run quickly towards me (photograph 3).

If, however, I clapped my hands it went down to the ground in its hiding posture with its head, neck, and belly flat to the ground. After six weeks it started to fly a bit once in a while and within a week or ten days I felt that it was about time for it to become self-supporting. It was brought back to the Louise Hall in a central aviary, but of course not the same where the old pair was still residing. It is now sharing its place with a pair of Crested Wood Partridges and a European Roller. It was only here that it had to learn to find its food itself and not to be hand-fed, but this it learned pretty quickly and fiercely counter-attacked the Roller if it dared come near any piece of food which the Stone-Curlew regarded as its rightful own (photograph 4). When attacking it spreads its wings and mutters the low sound its parents did when they were nesting. However, if I enter the Hall and utter the imitation squeaking sound of the young bird it still answers and starts to run towards me as quickly as it can.

This same year we had three other nesting attempts. On 11th May and 27th June, one egg was laid but the birds did not brood.

On 28th September, out of the second real nest which was constantly brooded, two young were born, but they died shortly after birth without ever having been on their legs at all.

* * *

FURTHER DATA RELATING TO THE BREEDING BEHAVIOR OF THE SPLENDID PIGEON

(*Columba speciosa*)

By Professor CARL NAETHER (Encino, California, U.S.A.)

Supplementing my brief report (in the last number of the MAGAZINE) on the behavior of the three Splendid Pigeons which have been in my aviaries for three years, I am pleased to state that yesterday, 28th June, their first youngster flew off the nest. The young pigeon is in vigorous health, and, like its parents, arboreal in habit. While the young of many other species of foreign doves and pigeons when leaving the nest for the first time are prone to drop to the floor of the pen and to remain there until they have achieved some dexterity in flying, the young Splendid Pigeon flew directly to a high branch in the aviary and has to this writing not dropped to the ground.

Whereas the mature pigeons have a rather bright red beak, one of the attractive features of this species, the youngster's beak is black, as are its feet. The overall coloration of this young pigeon is a non-glossy, rather drab rust-red. The white spots, so conspicuous on mature specimens, are entirely absent from the plumage of the young pigeon. However, the lower abdomen shows a whitish-grey color.

Most unusual and "unpigeonlike" has been the behavior of the three old birds in that there has not been the slightest tendency to fight the third bird, which I believe is a hen. Moreover, while pigeons usually become quite jealous of their nesting territory during breeding seasons, defending it vigorously, the Splendid Pigeons have never in any way exhibited aggressive behavior toward a male Bartlett's Bleeding-heart Pigeon which shares their aviary. In these respects the behavior of the Splendid Pigeons has, at least in my forty years' experience with both domestic and wild species, been *unique*. Incidentally, one of the parent birds remained on the nest with the youngster day and night until the latter flew off the nest, having been in it for well over three weeks.

I now believe that the reason why these pigeons did not raise their first squab, which I found dead in the nest when it was about ten days old, to maturity is that undoubtedly they were frightened off the nest during the night. When they failed to return to it promptly, the young squab, still very much in need of warmth, died of exposure, even though its crop was well filled.

Since this is the first time in many, many years that Splendid Pigeons have bred successfully in any American aviaries, I should appreciate learning if and when this species was first raised in the United States

HATCHING AND REARING OF KOOKABURRAS IN THE NATIONAL ZOOLOGICAL PARK, SMITHSONIAN INSTITUTION, WASHINGTON, D.C.

By Senior Keeper W. F. WIDMAN and Supervisory Keeper
H. M. VOROUS

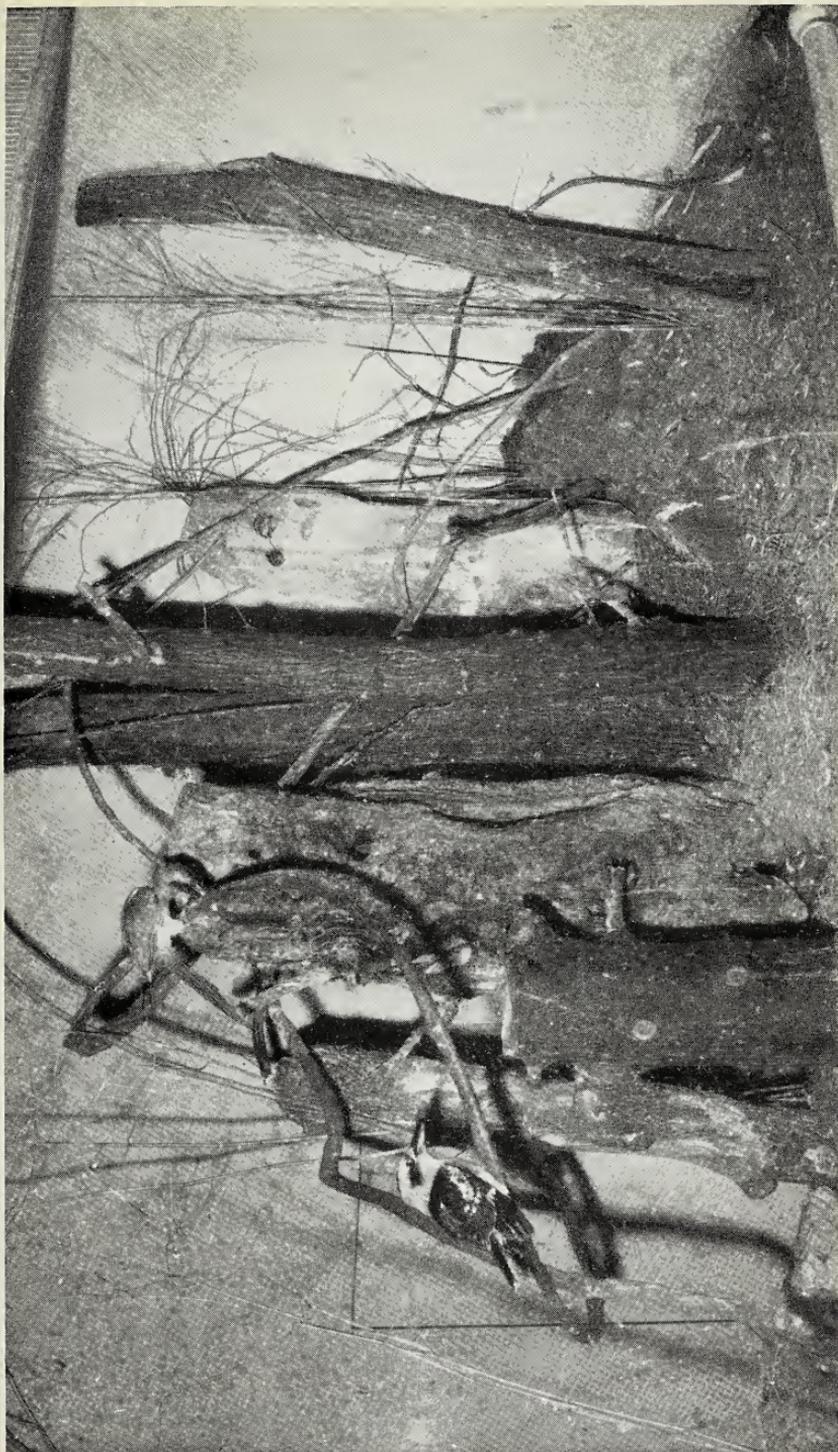
Kookaburras (*Dacelo gigas*), also known as Giant Kingfishers and Laughing Jackasses, have been exhibited in the National Zoological Park almost continuously over the years. The first ones were sent by Dr. F. W. Goding, United States Consul at Newcastle, New South Wales, in 1903. With their handsome appearance and raucous laughter, they are always favorites with their keepers and with the public.

Kookaburras in this Zoo had been shown in rather bare cages, furnished with perches, and had never shown any signs of nesting until a special cage was arranged for them last year. This was prepared by the keepers of the bird division as an exhibit of tree-nesting birds. Into it were put a pair of Kookaburras obtained from Sir Edward Hallstrom, President of the Taronga Zoological Park Trust, Sydney, Australia, in 1954. Sharing the cage were a pair of Grey Hornbills (*Tockus birostris*), two Golden-backed Woodpeckers (*Brachypternus benghalensis*), one Scaly-bellied Woodpecker (*Picus squamatus*), and ten Bobwhite Quail (*Colinus virginianus*). The quail were removed when nesting activities by the Kookaburras were first detected. The hornbills were removed when the young were ready to leave the nest.

The cage, with a glass front, is 15 feet wide, 9 feet deep, and 10 feet high, and contains several tree trunks of various sizes. A large hollowed birch, 4 feet in circumference, was selected by the Kookaburras for nesting. We filled the tree with cane litter up to about 5 inches below a hole in one side. This opening in the tree was ignored, however, the birds tunnelling out dirt from an opening mostly underground at its base, and entering from that point, removing the cane litter from the lower part of the tree. We then had to put screening inside the tree to keep the remaining cane litter from falling down on the nest. When the excavating was complete, performed by both birds, the nest was 2 to 3 inches below ground level.

The first egg, an unblemished white, was laid 22nd February, 1961, with a second egg laid the following day. The female started incubating. A third egg was seen in the nest three days later.

The male started sharing the incubation duties four days after the first egg was laid. Neither bird would leave the nest until the other had entered. At no time during the twenty-five days of incubation was the nest seen unattended. On four different occasions the female was



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VIEW OF THE CAGE, SHOWING THE KOOKABURRA'S NEST AT THE BASE OF THE THIRD STUMP FROM THE LEFT. The cage was not thoroughly cleaned during the incubation for fear of disturbing the birds.



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KOOKABURRAS AND YOUNG

Upper left and right are young males. Centre left—young female.
Lower left—adult male.

observed calling the male by rapping on the tree with her bill, and the male responded immediately and entered the nest.

Kookaburras at the National Zoological Park are fed exclusively on mice—an average of three a day—altered in no way other than cutting off the tails. It was decided prior to hatching to start the adult birds on mice that had been frozen, then cut in small sections, and thawed before feeding. This proved a wise decision as both birds were hesitant at first in accepting the cut-up mice, but the possibility of their attempting to feed whole mice to newly hatched young would have certainly proven disastrous.

On Sunday, 19th March, between 10 a.m. and 1.30 p.m., two-thirds of the blessed event occurred, the other third some time during that night or early the next morning. The young, bare of feathers and helpless, appeared to be all stomach and bulging eyes, even though the eyes were closed. The first day there was little feeding, six small pieces of mice.

The second day the unusual actions of the male, turning over leaves and rooting in the ground as if in search of insects, resulted in our offering roaches (*Periplaneta americana*) that were readily accepted. The second day the female left the nest three times, to eat, bathe, and once for no apparent reason at all. The male on all occasions immediately took to the nest. The light over the cage was left on until 10 p.m., allowing 15 light hours for feeding.

The food the first few days consisted of large roaches, twenty a day, trapped and freshly killed, and injected with multivitamins, and mice cut in quarter-inch lengths. Twelve chopped mice were offered and approximately four were eaten the second day. By the time the nestlings were seven days old, twelve mice a day were being fed. These figures apply to the whole family; it was, of course, impossible to determine how much was eaten by the parents and how much fed to the babies.

The adults fed the roaches and mice directly, after having crushed the roaches with their bills. Even though the mice had been cut in small sections, the parents held them in their bills and rapped them against a tree limb until they were thoroughly crushed and pliable before feeding. The young birds grew rapidly; at eleven days old they were three times their size at birth. Their eyes were still closed. They were eating sixty roaches a day, all injected with multivitamins—twenty at three different feedings—and twenty-one mice now being cut in thirds.

The young birds' eyes opened twenty-one days after hatching. They were then eating twenty-seven mice with twenty roaches a day. When about four weeks old, the more advanced of the three was seen at the entrance of the nest on several occasions, but was immediately forced back by the parents. Thirty days after hatching, the first bird was allowed to leave the nest. The other two were actually drawn out by

the female standing in front of the entrance offering the food, then backing out when the young attempted to feed with the offering still in her bill. This was repeated until she succeeded in her efforts to draw them out of the nest.

All three birds on leaving the nest were able to fly, only their bills and tail feathers were not fully developed. They had an overall darker plumage than the adult birds.

On 9th May, while the young birds were still being fed by the parents, the female again started nesting. She laid an egg on 10th May, another on 12th May, and a third on 13th May. The first brood were observed feeding themselves for the first time on 21st May.

Incubation began on 19th May and two of the eggs hatched on 6th June. On 7th June the female threw the remaining egg, which was rotten, out of the nest and broke it. The first hatching having been so successful, the same procedure was followed for the second. The two new babies are doing well.

* * *

LONDON ZOO NOTES

By J. J. YEALLAND

The Sarus Cranes which bred last year showed no sign of nesting at the same time this summer, but did so some four weeks later in mid-July. A possible reason for this was that the survivor of last year's brood lived next door and was on occasion offered food by the parents through the dividing wire-netting, but soon after this young one was moved out of sight of the adults, they turned their attention to nesting once more. If in the wild state the young survive, does this crane not breed each year but remain as a family party for two years, I wonder!

The second of last year's young, when almost fully grown, died as a result of being caught and held in order to have treatment for a slight injury to its beak, a death that might perhaps have been prevented by the administration of a tranquillizing drug. This year's chicks hatched between the 8th and 10th of August.

An arrival of especial interest is a Flame-crowned or Pucheran's Woodpecker (*Melanerpes pucherani pucherani*), new to the collection and presented, together with a Blue-rumped Tanager (*Calospiza cyanicollis cyanopygia*), a Black-eared Tanager (*Calospiza parzudakii lunigera*) and a Yellow-rumped Tanager (*Ramphocelus icteronotus*), by Messrs. G. H. and J. R. Newmark. The Woodpecker inhabits the area from southern Honduras to western and central Ecuador and a second race (*M. p. perileucus*) ranges from southern Mexico to northern Honduras.

Four immature Rollers collected in Spain by Mr. M. D. England have been deposited and two Squacco Herons received in exchange.

NEWS AND VIEWS

L. G. Middleton now has a flock of some thirty Masked and Fischer's Lovebirds flying at liberty—this must surely be unique.

* * *

John J. Yealland has been elected Editor of the *Bulletin* of the British Ornithologists' Club, in succession to Dr. J. G. Harrison, whose period of office expires at the end of the present year.

* * *

As described in an article in this number of the MAGAZINE, the Rev. J. R. Lowe has successfully bred the Stonechat (*Saxicola torquata*). This is a rare event, in fact I have only one previous record—W. E. Teschemaker, Devon, 1910, three hatched, two fully reared.

* * *

Frank Meaden has three pairs of Waxwings (*Bombycilla garrulus*) together in an aviary. One pair hatched their three eggs after sixteen days' incubation, but unhappily none of the young ones lived longer than four days. A second pair also had three eggs which, however, failed to hatch.

* * *

A. W. E. Fletcher has bred the Sulphury Seed-eater (*Serinus sulphuratus*). The first nest was in the shelter of a large mixed aviary. One fully-fledged young one was found dead on the floor. A second nest was built in the flight; a single egg was laid and the resulting young one was successfully reared. The hen is now sitting for the third time in the same nest on four eggs. This, too, is an uncommon event, possibly the first since W. Shore Baily's "first" in 1914.

* * *

Lloyd B. Thompson, British Columbia, writes: "The birds are doing quite well so far. At present we have two baby Ringnecks, three split-blue eggs hatching, and two lutino hens just laying. Plumheads have four young feathering. Prince Lucien's Conures have ten young. One pair of Lineolated Parrakeets have five young and the other pair have five eggs. Some Lineolated are as easy, or easier, to breed with than lovebirds: they are much hardier and can stand considerably more cold. Three young Bourke's are just leaving the nest. Redrumps have six fertile eggs."

* * *

Progress report from Major V. Dilwyn Jones concerning his Salmon-crested Cockatoos. He writes: "Just before I went on holiday in June I was fairly confident that they had laid again and on my return early this month I managed a peep one evening and found the cock

bird sitting on two eggs which looked 'good'. On Tuesday of last week [11th July] we heard squeaking in the log and it sounded like two chicks. This evening I caught both birds off and found one live chick and one dead one. The live youngster looks about a week or so old, but does not appear to be very healthy—it seems a bit bloated looking.

"The young Citron-crested is fine and I think should be out next week."

* * *

News from New Guinea. F. W. Shaw Mayer writes: "Sir Edward Hallstrom was up here for three days in the middle of June—his visits are always memorable. A bird British aviculturists would like to have is our Fig Parrot 'Double-eye' (*Opopsitta diophthalma festetichi*). It is very similar to *O. d. diophthalma*, which I believe dear old Frost once brought to England. They are plentiful at 4,000 feet (1,500 feet lower than we are here at Nondugl). They are easy to cater for—sunflower seed and fruit—and easy to breed. We have a number. Early this year we bred one Lesser Bird of Paradise (*Paradisea minor finschi*) and a Ribbon-tailed (*Tæniaparadisea mayeri*)—both young birds have now grown up. At the moment a pair of Blue Birds of Paradise (*Paradisornis rudolphi margaritæ*) have a young one in the nest eleven days old. This pair successfully bred last year." If only Sir Edward would send us regular notes from his Fauna Station!

A. A. P.

* * *

REVIEWS

GENETICS FOR BUDGERIGAR BREEDERS. By T. G. TAYLOR, M.A., Ph.D., and C. WARNER. Published for "Cage Birds" by Iliffe Books Ltd., London, 1961. Price 17s. 6d. net.

The Budgerigar has been a favourite object for the study of genetics in birds for many years, since under domestication it has developed a very wide range of colour variations and other mutations. Moreover it is of especial interest as one of the few domesticated species that has never been crossed with any other species. Dr. Dunker was a pioneer in this subject and together with Cremer produced tables of expectation which were given to the Budgerigar Society. These authorities and also Steiner in Switzerland, showed that the inheritance of colour in these birds followed the classical Mendelian principles. The best known work in this country, however, is *The Genetics of the Budgerigar* by Professor F. A. E. Crew and Miss Rowena Lamy of the Institute of Animal Genetics, University of Edinburgh, published in 1935, but this work has long been out of print, and there was a clear need for a book to assess the present position of the subject, and to indicate lines of advance.

The various general books on the breeding of Budgerigars, including such works as *Budgerigar Matings and Colour Expectations* by F. S. Elliot and E. W. Brooks, do not attempt to give full genetical details.

The present work will be of great value to the many breeders who find it difficult to understand the genetical side of Budgerigar breeding. Dr. Taylor, who studied genetics at Cambridge, has kept Budgerigars for almost thirty years and regards himself primarily as a fancier, and during the past four years, in collaboration with Mr. Warner, also a geneticist, has been engaged in a programme of research on the mapping of the sex-linked series. The book covers the whole field of Budgerigar genetics in a simple and direct manner and should be intelligible to any one prepared to make a serious study of the subject. The first chapter, based largely on the work of Dr. Auber, deals with feather structure and colour, and whilst not essential for an understanding of the genetics of colour, it certainly adds to the interest of breeding these birds, and enables predictions to be made of colour expectation when new combinations of varieties are made by cross breeding. Then follow chapters on genes and expectations, the chromosome theory, leading on to linkage and sex-linkage which then become understandable. Practical breeders will find the chapters dealing with mutations and what to do with a new mutation of especial interest; also the summaries of the composition of the various colour varieties and how they are produced. The final chapter deals with genetics for the breeder of exhibition Budgerigars, with a table showing the proposed names and symbols of mutant genes in the Budgerigar.

This work can be thoroughly recommended to both amateur and professional breeders who wish to have a better understanding of the scientific basis of the subject.

E. H.

* * *

BIRD DOCTOR By KATHERINE TOTTENHAM. Thomas Nelson and Sons, Ltd. Edinburgh, 1961. Price 15s.

This is an interesting collection of anecdotes of the author's experiences with many kinds of sick and damaged birds, and the way in which by trial and error she has learnt how to treat the different cases. The patients usually became quite tame during the treatment and the behaviour of such diverse pets as a Razorbill and other sea-birds, various corvids, Blackbirds and even a Mute Swan, to name only a few of the birds kept for varying periods after their recovery, is graphically described. It is noted that once tamed and provided with the best possible conditions, most pet birds are more than content with their lot.

E. H.

CORRESPONDENCE

PACKING BIRDS FOR AIR SHIPMENT

I have read with interest the article "Packing Game Birds for Air Shipment" by K. C. Searle in the January-February issue of the AVICULTURAL MAGAZINE. I agree with Dr. Searle that the padding for the top of the crate is of paramount importance. With adequate protection against head damage and a satisfactory water supply, the wildest birds can be safely handled by air freight.

I have a suggestion for padding the top of the crate which may be of interest. In shipments of birds to Ceylon and to Indonesia, I have found that sheets of foam rubber make excellent padding for the shipping crates. My crates are constructed of 1 by 1 inch pine frames covered with $\frac{1}{8}$ inch plywood. The front is covered with $\frac{3}{16}$ inch mesh hardware cloth with the feed and water troughs set under the edge of the screen. The top and sides of the crate are padded with foam rubber sheet. For small birds I use $\frac{3}{4}$ inch thick foam rubber and for the largest and wildest, $1\frac{1}{2}$ inch foam rubber sheet.

The sheets of foam rubber are available here from upholsterer shops as scrap pieces at a reasonable price. The sheets of foam rubber may be glued in place or stapled to the roof and sides from the rubber side. The staple will be completely imbedded in the rubber. If the ends of the staples extend through the plywood, they should be bent over to avoid injury in handling. I have found that some air-lines staple their labels on the crates and the ends of the staples protrude inside. These sharp points may cause serious damage to the birds. As these labels are most often stapled on the sides, the padding of foam rubber covers them so no damage to the birds occurs.

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J. G. SUTHARD.

RAIN BATHING

In his recent article on "Rain Bathing" (*antea* 67 : 90), C. J. O. Harrison described the behaviour of Budgerigars (*Melopsittacus undulatus*) "bathing" in green salad, and concluded that "the recognition of wet vegetation as a bathing medium appears to be innate".

My own observations agree with those published by Harrison, but I have also noted "bathing" behaviour under the following conditions : (i) in a glass bowl, filled with water to a depth of 3 or 4 inches, with green leaves floating on the surface of the water (ii) in a green plastic bowl, filled with water as before, but without any floating vegetation. Behaviour was equally intense under either condition, but no bathing occurred in a glass bowl in the absence of vegetation.

It would thus appear that the colour green, in association with water, is sufficient to release this behaviour, and that the form in which this colour is present is not important.

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PETER R. EVANS.

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The seventeen Candidates for Election in the July-August, 1961, number of the AVICULTURAL MAGAZINE were duly elected members of the Society.

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NOEL STEVENS, Hope Court, Hope Bagot, Nr. Ludlow, Shropshire.

CHANGES OF ADDRESS

RONALD L. BLAKELY, to Curator of Birds, Chicago Zoological Park, Brookfield, Illinois, U.S.A.

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Dr. HOWARD GUREVITZ, to 3700 Edison Street, San Mateo, California, U.S.A.

C. J. O. HARRISON, to 14 Dawlish Avenue, Perivale, Middlesex.

F. E. B. JOHNSON, to The Grove, Stagsden, Bedford.

H. MANFIELD, to c/o Yilki P.O., via Victor Harbour, South Australia.

RALF H. MASURE, to c/o B. Rucker, 1665 Vyse Avenue, Bronx 60, N.Y., U.S.A.

F. W. SHAW MAYER, to Hallstrom Fauna Station, Nondugl, via Goroka, New Guinea, via Australia.

P. ORSATTI, to 97 Beaver Avenue, Toronto, Ontario, Canada.

K. L. PENWARDEN, to Alken Lodge, Orange Road, Newlands, Cape Town, South Africa.

C. T. RIDLEY, to Group 7, Box 6, RR. 1, Headingley, Manitoba, Canada.

D. H. S. RISDON, to Rode Manor Gardens, Rode, Nr. Bath, Somerset.

R. H. SMEATON, to P.O. Box 50, Mazabuka, Northern Rhodesia.

R. G. L. TILLEY, to "Niltava", 243 Avenue du Chêne, Heusy, Verviers, Belgium.

E. N. TURNER, to 32 Kings Road, Salisbury, Wilts.

R. A. VOWLES, to "Mayfield", Sway Road, Brockenhurst, Hants.

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AVICULTURAL MAGAZINE



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[New York Zoological Society

FEMALE TACAZE SUNBIRD (RIGHT) AND YOUNG ON ARTIFICIAL NEST,
NEW YORK ZOOLOGICAL PARK, 1960.

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AVICULTURAL MAGAZINE

THE JOURNAL OF THE AVICULTURAL SOCIETY

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NOVEMBER-DECEMBER, 1961

BREEDING OF THE TACAZZE SUNBIRD (*Nectarina tacazze*) AT THE NEW YORK ZOOLOGICAL PARK

By WILLIAM G. CONWAY (Director, Curator of Birds)

Sunbirds have rarely been bred in collections. While Mr. Edward Boehm, of Trenton, New Jersey, has bred the Scarlet-chested Sunbird, it appears that no other collection has recorded a similar feat. This paper presents new information on incubation and nesting behavior as observed in a pair of Tacazze Sunbirds on exhibit in the New York Zoological Park's Jewel Room.

The breeding female and male sunbirds were both acquired from Mr. John Seago, on 5th March, 1953, and 7th June, 1958, respectively, and had been exhibited together for more than a year when it was decided to attempt to induce breeding with an artificial nest. A small, purse-shaped nest was constructed of cacique nest walls which we had brought from Trinidad some time previously. Soon the female was noted carrying bits of grass and re-arranging the artificial nest; kapok was provided for nest lining and the female was left to work. While the male drove the female frequently and displayed daily, he did not help build the nest in any way. The courtship display is distinguishable from threat display, which it greatly resembles, by a strange side-to-side swinging of the tail.

After more than two months of nest building and courtship activity, a single pale-bluish, heavily mottled egg was laid by the female on 27th May, 1960. One egg is the usual clutch in the wild. The cage front was covered to prevent the public from disturbing the birds, but a few days later the egg was found broken in the bottom of the cage. The cage front was left uncovered hereafter and three further eggs were deposited in the nest by the female. Incubation periods and the nidification periods of the two young which survived to leave the nest are outlined in the chart below.

The 1960 breeding of a pair of *Nectarinia tacazze* :—

<i>Egg No.</i>	<i>Date laid.</i>	<i>Date hatched.</i>	<i>Date young left nest.</i>
1 . .	27.5.60.	Broken	—
2 . .	21.6.60.	6.7.60.	26.7.60.
3 . .	12.8.60.	28.8.60.	(Died 30.8.60.)
4 . .	9.9.60.	25.9.60.	15.10.60.

It will be seen that the average incubation period was fifteen-and-a-half days and nidification required twenty days. Incubation and brooding, for the first seven days, was performed entirely by the female, which incubated steadily but for short intervals of rest and feeding, despite the fact that the ambient temperature varied from 72° to 88° F. The young bird was fed by both parents, but here again the female performed most of the work. Nest sanitation was also performed by both sexes. The two young birds which successfully left the nest returned to it for roosting the first few nights, and both birds, which successfully completed nidification, were found drinking from the feeding tubes within a few hours of leaving the nest. In rearing the young birds, the adults fed them some nectar from our feeding tubes, as well as great quantities of small insects which keepers collected with sweep nets during two or three sallies each day. Thousands of fruit flies were made available and the female was often observed to line one up after another in her beak, like a puffin carrying fish, and then to pump them into the young bird's gape in a machine-gun-like fashion. In each case the young bird was removed from the cage within a week of the completion of nidification.

Sunbirds do extremely well at the Zoological Park on a formula consisting of : Ledinac (a liver protein hydrolysate, Lederle Laboratories), Mellin's Baby Food, sweetened condensed milk, beef extract, honey, supplementary liquid vitamins, supplementary fruit flies.

* * *

BREEDING OF THE RUFOUS-BELLIED NILTAVA (*Niltava sundara*)

By K. A. NORRIS (Purley, Surrey, England)

This, the most beautiful of the flycatchers, is now too well known to aviculturists to need a detailed description and both sexes are well illustrated in *Indian Hill Birds* by Salim Ali. A plate by Grönvold appeared in the AVICULTURAL MAGAZINE, New Series, Vol. 2, No. 1 (1903-4), but in this the legs of the male are incorrectly shown as yellow whereas they should be black, and those of the female should be very dark-brown. The general colouring of the latter is also far too dusky, the upper parts being russet and the breast buff with a crescent mark on the upper breast much less prominent. The "tabs" on each side of the neck are a brilliant pale blue, although these are often completely concealed except when the bird raises its head.

The Niltava frequents high forest, usually in the close vicinity of rock-strewn water-courses where the vegetation is dense and insect life abundant and, unlike our familiar Spotted Flycatcher, is seldom seen at any great height above the ground, preferring to perch on some moss-covered rock or tree root in the deep shade of the moisture-laden undergrowth, making short flights in pursuit of winged insects or, more frequently, darting on those moving on the ground. Although insects form its main diet they are sometimes supplemented by berries and other small fruit. Its range is given as the Himalayas, from Murree to extreme East Assam; Manipur and Lushai Hills; Chin and Kachin Hills, and down through the hills of Central Burma to Tenasserim, Indo-China, and Western China. In summer it is found at elevations from 5,000 to 8,000 feet, descending in the winter to lower levels and into the foothills.

Wynne (Key List of the Palaearctic and Oriental Passerine Birds) mentions three races of *Niltava sundara* but does not give the range of the individual races. Those listed are *N. s. fastuosa* (Lissen), 1840; *N. s. sundra* Hodgson, 1837; and *N. s. denotata* Bangs and Phillips, 1914, but I understand that the actual differences between these races are very slight and as I have no knowledge of the locality from which my own birds were obtained, it is not possible to say to which race they belong.

In the AVICULTURAL MAGAZINE, New Series, Vol. 1, November, 1902, Mr. Russell Humphrys describes a male which he received in June of that year and there is also mention of one being exhibited at the London Zoo, for the first time, in June, 1901. These birds were privately imported by Mr. E. W. Harper, a member of the Society at that time, and were believed to be the first living examples of the species to reach this country.

In December, 1957, I was offered a pair of these beautiful flycatchers which I purchased in the hope that I might be able to induce them to breed. For some weeks they were kept in a 6-foot stock cage in my small tropical house, but very soon after their arrival I found it necessary to separate them as they were constantly bickering, the hen being particularly aggressive towards her mate whenever he attempted to feed. The cage was accordingly divided by a wire slide and they remained separated until the early spring of 1958 when I noticed that the cock was beginning to sing softly, and the hen to show evident signs of welcoming this attention. This seemed an opportune time to reunite the pair, but rather than risk further trouble in the confined space of the cage, I left the dividing slide in place and opened both doors, leaving the birds to find their way out.

At this point I should perhaps explain that the building in which they are kept is 12 feet by 15 feet, and 9 feet high, built of brick and lighted from above only, the entire roof being of transparent fibreglass, insulated with polythene sheeting, and it is used as a combined bird and plant house. Humidity is maintained by the presence of a small pool and a number of fish tanks and it is heated by electricity, the temperature being controlled at a minimum of 55° F. During the spring and summer months it is heavily overgrown with a tangle of climbing plants which provide shade and also excellent facilities for nesting. A number of nest-boxes of various types are hung high up on the walls and screened by growing plants and branches of cupressus, the latter being particularly useful for this purpose since it retains its foliage long after it has been cut.

This accommodation is shared by a pair each of Yellow-winged Sugarbirds, Zosterops, Yuhinas, Violet Tanagers, and the Niltavas. The Zosterops in particular are indefatigable hunters of tiny insects and I have found them invaluable as a means of exterminating both white fly and mealy bug, pests which are normally so difficult to control in tropical plant houses.

Early in May the hen Niltava started to build on a rafter immediately above the entrance door, using long strands of fibre which she had stripped from the bark of dead branches, dried grasses, and the withered foliage of narcissus, for the foundation of the nest. The latter material I have found to be readily accepted by most species of nest builders as it is pliable and easily woven into position. The Niltava proved to be a particularly untidy builder, leaving long strands trailing from the nesting ledge and these caught on the top of the door every time it was opened with the inevitable result that the partially-built nest was eventually dislodged and fell to the ground. In spite of this misfortune, the hen persisted in using this site and to obviate the risk of the nest again being destroyed I fixed a 3-inch strip of wood to the edge of the rafter thus forming a shallow tray to hold the materials together. In

this tray the nest was eventually completed, the cup being deep and beautifully formed of fine grasses and a small amount of moss, but still with many long strands trailing from the rough foundation. It was not until the hen was actually incubating that she began to draw up these strands, weaving them into the rim of the nest and thus building up the sides until she was completely screened from view.

Three other nests, built later by a different hen, all followed an identical pattern, the untidy, trailing mass of foundation materials being gradually drawn up and woven into the sides after the hen had commenced incubation and I therefore feel that it is safe to assume that this is the normal method of nest construction followed by the species. The descriptions of nests of *Niltava sundara*, quoted by Dr. A. G. Butler (*Foreign Birds for Cage and Aviary*), however, differ materially, the writers stating that those which they had found were loosely made and very shallow, in one case being a mere pad of moss, with a very broad, shallow depression in the centre. The eggs are described but no reference to the young is made and I suspect that, in each case, the nests were found at an early stage when the hen was still laying and incubation had not commenced.

For over three weeks the hen continued to sit and on only two occasions during the whole of that period did I see her leave the nest to feed. Obviously she must have taken food each day, but her movements had now become very stealthy and she would neither leave nor return to the nest whilst I was anywhere in the near vicinity.

Contrary to the statement made by Salim Ali (*Indian Hill Birds*) the cock took no part in nest building nor did he share in incubation, in fact he never even approached the nest site and the only indication that he was aware of its existence was his constant "scolding" note if I myself was anywhere near the sitting hen.

Finally the hen re-appeared at feeding time and failed to return to the nest, apparently having lost all interest, and on examination, I found three infertile eggs, approximately the size of those of the English Robin, pale cream in colour, very lightly freckled with reddish-brown. No further attempt at nesting took place and in the late summer the hen was found drowned in a fish tank, having apparently squeezed through a hole in the covering glass which was little more than an inch in diameter.

It was not until early in the following year that I was able to obtain another hen, a bird which, although well developed, was obviously immature, as her plumage was entirely of a very dull brown, completely lacking the bright russet tones of the tail and upper parts, nor was there any sign of the pale crescent mark on the upper breast or the brilliant blue "tabs" on the sides of the neck, and it was not until the autumn moult that the full adult colouring was attained.

For the first few weeks after her arrival she completely ignored the

cock and he in turn showed little interest in her, but with the approach of spring she began to exhibit resentment at his increasing attention, retiring before his approach and occasionally turning on him with snapping beak. The more the cock persisted, the more she resisted until he lost his nerve and retired promptly whenever she alighted near him. Unfortunately I paid little attention to these signs of discord, thinking that there was ample cover and sufficient room for the cock to escape to safety should the hen attempt to press her attacks too far, and although he was obviously making no progress in his efforts to pair, he appeared to be in perfect condition and gave no evidence of undue distress.

This unsatisfactory state of affairs continued for some time and then, one morning, I found the cock dead on the ground. There was no sign of injury, but he was very thin indeed and there is little doubt that the hen had persistently refused to allow him to feed, driving him into cover whenever he attempted to approach the food trays.

Again I experienced considerable difficulty in obtaining a replacement, but eventually another cock was secured towards the end of June of last year. This bird arrived in very good condition and was placed in the stock cage, the hen being still at liberty, but he soon became so restless that, in spite of my previous experience, I decided to risk allowing the birds together and opened the cage doors.

Instead of the cock coming out, however, it was the hen that made the first advances by immediately entering the cage and giving every sign of welcoming her new mate. She remained quietly in the cage for some time and then both birds came out together and the cock promptly went down to the bath where he proceeded to soak his plumage so thoroughly that he had difficulty in regaining a perch.

Possibly because the hen was not in full breeding condition and the cock had not gained sufficient confidence to make any serious advances to her, there was no sign of disagreement and, in fact, this pair have at all times remained on the most friendly terms with each other.

The season was already well advanced and, as might have been expected, they made no attempt to breed. They completed a satisfactory moult, the hen then assuming her full, adult colouring, and passed the winter in perfect condition. In April of this year the cock commenced to sing, or perhaps "warble" would be a more correct description for the bird has a weak voice and the song, though melodious and varied, is little more than a whisper, continuing for periods of up to fifteen minutes without a break. At the same time the hen became restless, continually moving and searching under the staging, investigating the darker corners of the building, then flying to the rafters to continue her search.

It was at this time that I first saw the cock display. He was singing softly and was apparently completely relaxed, taking no notice of the

hen who was searching amongst low growing plants, but as she moved directly below him he suddenly “ exploded ” into violent action, diving from his perch straight down towards her as she fled with one single, shrill note of alarm. Three times she circled the room with the cock in swift pursuit and then both birds came suddenly to rest within a few inches of each other on the ground, the hen crouching with snapping beak, and the cock tense and motionless with his back turned half towards her, tail and flights pressed to the ground, body erect and beak pointing upwards, displaying to full advantage the beauty of his shining blue plumage, very much as does the male Golden Pheasant when displaying to his hens. This display lasted only a matter of seconds and as suddenly as it had commenced, both birds relaxed, the hen moving unconcernedly away to continue her investigation of the undergrowth and the cock returning to his perch to continue singing. No actual mating had taken place.

At no time had I seen the previous cock display and I am now inclined to think that the failure of the nesting attempt in 1958 may have been due to the fact that he never really came into breeding condition.

Eventually the hen chose a nest-box placed high up on the wall, well screened by cupressus and climbing plants, and there she constructed a nest similar in every way to that already described. On the 25th May she was on the nest most of the day and I imagine laid her first egg, and from the 27th she commenced incubation and also to tidy up the foundation of the nest, completing the latter operation in two days.

Fourteen days later she came off the nest at feeding time, and both birds “ scolded ” continuously, the hen carrying a mealworm in her beak but refusing to return to the nest whilst I remained in the building. As the days passed, however, she became less nervous and carried food to the nest whenever I was screened from view by the curtain of climbing and trailing plants which I had allowed to grow unchecked since nesting commenced and which had now converted the building into a veritable jungle.

The cock assisted in feeding although his visits to the nest were far less frequent and he seldom carried more than a single insect at a time, whereas the hen collected fruit-flies, blow-flies, woodlice, spiders, mealworms, and gentles, all of which she part-swallowed until her throat was bulging, before entering the nest-box where she then remained for some time, apparently feeding the young by regurgitation. Although mealworms and gentles, of which they had an unlimited supply, must have formed the bulk of food taken to the nest, woodlice seemed to be specially favoured and each morning and evening I lifted every flower pot in the building, the birds immediately pouncing on any that were thus exposed to view.

On entering the building on the morning of the 20th June, ten days

after the young had hatched, I was met by an absolute storm of abuse, both birds repeatedly flying at my head, and passing so close that on several occasions I felt them actually brush against my face. As I moved across the room, a young bird flew strongly from a low growing shrub onto an electric cable suspended some 5 feet above the ground and there, fully exposed, it sat watching me with no sign of alarm, in spite of the urgent warning notes of its parents. At a glance it could readily have been mistaken for a young native Robin, the whole of the head, back, and underparts being russet brown, heavily mottled, but on closer inspection, the wings proved to be entirely dull black and the extremely short tail of an intense, deep blue. The eyes were large and very dark, the beak and feet black, the former still with the yellow gape common to most young passerines.

No further young appeared and as the parents were able to concentrate the whole of their attention on their single offspring, it is not surprising that its development was unusually rapid. Its tail grew to normal length within a few days and by its colour, proved that it is possible readily to distinguish the sexes of young Niltavas as soon as they are fledged. Within four days it was picking up food from the ground and on the sixth day made a determined, and successful, attempt to capture a blow-fly on the wing. It is of particular interest to note that it discovered and gorged on an over-ripe pear which had been left to encourage fruit-flies, although I have never known the adult pair to take any form of fruit other than occasionally to pick out a currant from food which I was preparing for Waxwings. It may have learnt to take this fruit from the example of other species in the room, but certainly not from its own parents, although Mr. Russell Humphrys (*AVICULTURAL MAGAZINE*, November, 1902) mentions that a partiality was shown by this bird for over-ripe pear and greengage.

In the meantime the hen was already building a second nest in another nest-box and again commenced incubation on the 27th June. Young duly hatched on 11th July, but three days later one was thrown out and its condition suggested that it had been dead for at least a day, although it was possible to see that the down on the head and back was black, the skin entirely of a very dark colour, and the only relief to this sombre colouring was the light yellow of the gape. Evidently the remaining young did not make normal progress as they remained in the nest until the 26th July when two were apparently forcibly ejected by the hen for they were very backward and quite unable to fly. I replaced them in the nest but the parents obviously had finished with them and on the following morning, the smaller of the two was again on the floor, dead. This youngster was entirely brown, including the wings and tail and presumably was a hen. There was one infertile egg remaining in the nest and this clutch had therefore consisted of four eggs which I should imagine to be the normal average.

The second young bird died on the following day, the adult hen now being fully occupied in building a third nest, whilst her mate and also the young cock from the first nest were both singing continuously, the young bird's voice being already fully developed.

The culminating tragedy occurred three days later when the hen was found dead with a shell-less egg entangled in her breast feathers, and I can only blame myself for her loss as I had discontinued the use of powdered cuttlefish bone and "Radiostol" which I normally add to the soft-food mixture during the nesting season, and which I have always found to be invaluable in preventing egg-binding.

Now (30th August), the young cock is rapidly assuming full adult colouring, brilliant blue feathers appearing on the back and head, and clear chestnut spreading from the flanks and gradually replacing the mottled brown feathering of the underparts. He is bold and extremely inquisitive, even alighting on my arm to inspect parcels of fruit or food trays which I may be carrying, and when I was carrying out alterations to one of the enclosures recently, he spent some time by my side, removing some twenty nails from the tool box and even managed to drag the lighter tools across the floor.

As described above, K. A. Norris has bred the Rufous-bellied Niltava (*Niltava sundara*). It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING OF THE CAYENNE TANAGER

(*Tangara cayana*)

By H. MURRAY (Cornsland, Brentwood, Essex)

The Cayenne Tanager is about the size of a sparrow but is somewhat slimmer and more graceful being a very curious and active little bird.

The colouring is not spectacular; the crown is brown with large black cheek patches. The back of the cock is a golden oatmeal and wings, tail, and breast blue. The hen is a duller version of the cock.

These birds were sent to me from British Guiana two years ago and have been fit ever since. In their own country they are known as the "Buck Town Suckie"—a most attractive name!

At the end of July they started to nest in a branch of broom about 8 feet above the ground. The nest was a very flimsy structure made of dried grass but it must have considerable strength for in spite of its fragile appearance it seems strong enough. Two eggs only were laid

and I am not sure of the exact date as the hen was very nervous and I did not want to disturb her unnecessarily. However, from their second nest I have seen that the eggs are whitish with black scribblings. The young are covered with black down.

As far as I could tell the young were a good three weeks in the nest—a very long time indeed for a bird of this character. Sex was clearly apparent as soon as the young flew. They were a pair and the young cock was very like the hen while the young hen was much duller.

The parents were excellent and very devoted to the young. The young were fed on fruit and my usual softbill mixture. Maggots and mealworms were also given in large numbers. I tried very hard to see if these latter were given whole or by regurgitation, but I am pretty sure that they were fed entirely by regurgitation. Like most Tanagers these birds ate a considerable amount of seed. This was eaten whole and not cracked.

At the time that these notes are written the birds have two young a week old in their second nest, but the summer has run out and it is a matter of luck whether they rear.

It may be of interest to record that the Redwing with which I was lucky enough to win the Society's Medal last year is still doing well and seems to have become a good bird.

As described above, H. Murray has bred the Cayenne Tanager (*Tangara cayana*). It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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BREEDING OF THE YELLOW-FRONTED WOODPECKER

(*Melanerpes flavifrons*)

By J. E. COLLINS (Great Houghton, Northampton, England)

I think our members will be interested in the news that my Yellow-fronted Woodpeckers (*Melanerpes flavifrons*) have successfully bred this year. I purchased these birds in April, 1959, to supplement my show team, and after acclimatizing them I exhibited them with a fair amount of success.

In the spring of 1960 they were put into a small flight to moult and to see what intentions they had of breeding. They were given a

hollow log and an old lovebird nest-box ; they went to nest in the nest-box and laid four eggs of which only one hatched, and the chick died at about two weeks old. After three weeks I noticed the hen paying attention to the nest-box again ; this time she laid five eggs but unfortunately there was again only one chick and this died at ten days. By this time I was convinced that the flight was not big enough, and as the year was getting on I decided to get them fit and show them again, which I did with more success.

During the winter of 1960-61 I built a flight of 30 by 10 feet round some small fruit trees. The birds were put into the new flight during the first week in May, together with the old nest-box which was hung on a post 6 feet high and facing south. In the same flight I put a pair each of Purple Crested Touracos, Cordon-bleus, Spice Birds, Cape Doves, five Bengalese, and a trio of Golden Pheasants.

Although the Woodpeckers were using the nest-box to sleep in they gave no signs of going to nest for about five weeks, then I noticed that they had started to clean out every scrap of peat I had put in to cover up the perforated zinc false bottom of the box. This went on for two or three days and at midday on 14th June I noticed an egg lying on top of a log ; on picking it up I realized it was a Woodpecker egg ; this caused a few hectic moments, because I had to decide whether to waste the egg or to chance upsetting the birds by putting the egg into the empty nest. I thought I would take the gamble and save the egg, so into the nest it went. The hen was out and about as usual until 16th June, when she disappeared for two or three days. After this both parents appeared to take turns at sitting for ten to fifteen-minute intervals. The nest was never left during my presence either for inside or outside observations. It was eleven days before the nest was left unattended so I took the opportunity of having a look and, to my great delight, there were two chicks and one egg which later disappeared.

For the first two or three days I noticed the birds were feeding only live ant eggs, on the fourth day they started taking some madeira cake soaked in Stimulite Nectar, together with some very young maggots. In a fortnight they fed a little ripe pear and this continued for two more weeks and they then started feeding grated apple dusted with Glucodin and Sluis.

On 26th July I saw one of the young looking out of the nest, and on 29th July both young left the nest for the first time ; I did not see them again for two days but after that they came out regularly. Both the young are cocks, having identical markings to the adult cock, but the red and yellow are quite a bit paler. They are now feeding themselves and are eating a full mixed diet, except that they are now on egg food instead of cake ; incidently, the adult birds had egg food at hand when feeding but it was ignored.

As I have a spare hen of the same species I am looking forward to attempting to breed a second generation next year.

As described above, J. E. Collins has bred the Yellow-fronted Woodpecker (*Melanerpes flavifrons*). It is believed that this may be a first success.

Any member or reader knowing of a previous breeding of this species in Great Britain or Northern Ireland is requested to communicate at once with the Hon. Secretary.

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MY AFRICAN PARROT AND PARROT-LIKE BIRDS

By K. L. PENWARDEN (Newlands, Cape, South Africa)

I am indeed fortunate in having a very large aviary built on my property on the slopes of Table Mountain, overlooking the southern suburbs of Cape Town. During November, 1960, my wife and I moved into our new home and I gathered my birds together from the four corners of Cape Town where my friends were kind enough to keep them for me whilst the house and aviaries were being built.

The aviary is approximately 65 feet in length and 12 feet in width and subdivided into eighteen separate flights. Our members may be interested in the types of birds in my aviary and the small success I have had in breeding during this year. I will describe the birds flight by flight.

Flight No. 1

I have one pair of Fischer's Lovebirds (*Agapornis fischeri*) and they are presently on eggs having previously reared three youngsters.

Flights Nos. 2 and 16

In each of these flights I have one pair of African Ring-necked Parrakeets (*Psittacula krameri*) but, perhaps as I imported these birds from Holland during the year, they have not yet gone to nest.

Flight No. 3

The pair of Peach-faced Lovebirds (*Agapornis roseicollis*) in this flight carry my hopes for the future. The hen is completely "rosy" in colour but the cock does not carry the "factor". She is presently on eggs and failing to obtain a cock with some "rosy" or pink colouring I will be forced to mate her next year with one of her offspring.

Flight No. 4

The two Madagascar Lovebirds (*Agapornis cana*) in this flight have been disappointing as the hen has laid at least eighteen eggs during the last five months but not one has been hatched due, I think, to the nervousness of the hen who leaves the nest on the least provocation. Except for the first set of eggs all the other eggs have been fertile.

Flight No. 5

The two pairs of Nyasa Lovebirds (*Agapornis lilianae*) seem to be poor breeders but have reared one youngster between them.

Flight No. 6

The two Meyer's Parrots (*Poicephalus meyeri*) have not gone to nest although I have recently seen them mating. The hen I acquired only four months ago and she was in bad condition on arrival with her flights clipped. Normally these birds breed during April to June but later breedings in the wild are on record.

Flights Nos. 7 and 18

In this flight I had kept a pair of Rüppell's Parrots (*Poicephalus rüppellii*) but lost the cock during the year. This loss upset me very much as both birds escaped from my father's aviary when I tried to bring them home. After two days at liberty both "homed" and my father was quite pleased to report that he had recovered my birds. I have transferred the hen to flight No. 18 and two Budgerigars which invaded my aviary (gaining access through the large gauge netting) are now the proud parents of five youngsters in this flight.

Flights Nos. 8 and 13

In flight No. 8 I accomplished my greatest success. During January, 1960, I bought two pairs of Red-faced Lovebirds (*Agapornis pullaria*) from a person who assured me that he had imported the twenty-odd birds he had for sale from Angola. Quite frankly I had a suspicion that the birds had entered the country in a rather unorthodox fashion and for one month kept them far from my other birds. They soon settled down and each pair would retire for the night in a nest-box. Although on one occasion I saw a pair mate they ignored the "ant-heap" I built for them in the branches of the natural perches in the flight. I managed to acquire a piece of granulated cork (used by plumbers, I believe) which I cut into squares of approximately 20 inches by 15 inches. After wiring these squares together I obtained a thickness of about 8 inches. I attached this piece of cork to the perch in the covered part of the aviary and made a small entrance in the bottom left-hand corner. Within two days I noticed that the birds were busy enlarging the entrance. After sixteen days the tunnel had

reached the stage that one pair spent the night in the nest which enabled me to move the remaining pair to flight No. 13, previously occupied by a pair of Cape Parrots (*Poicephalus robustus*) which I had lost under distressing circumstances a short while before.

The hen bird then disappeared completely and my wife was asked to keep an eye on this flight during the day to see if the hen came out to feed. We were never able to detect any sign of her and I was becoming worried. After a lapse of what seemed to be more than a month I saw the hen one morning and this delighted me, as I was leaving for London on business for about twenty days. Just before my departure from London I received a cable from my wife to say that three youngsters had emerged fully feathered. On my arrival back home I learnt that one youngster had managed to get through the wire and was found dead in the enclosed passage-way. However, at the time of writing, both surviving youngsters are fit and well and have now been out for over a month.

The pair in flight No. 13 have not bred but then I have not been able to find a suitable supply of cork.

This breeding has encouraged me as I believe that it is only the second success in this country, the first being by Mr. David Dale who, I understand, has not repeated his breeding. (See *Avicult. Mag.*, 1959, pp. 119-123.—*Ed.*)

Flight No. 9

The pair of Abyssinian Lovebirds (*Agapornis taranta*) have excelled themselves in laying four eggs and hatching all four. At the moment all four youngsters are still in the nest but I am confident as these birds of mine are excellent parents.

Flight No. 10

The pair of Black-cheeked Lovebirds (*Agapornis nigrigenis*) are on eggs and as these birds are good breeders I should have some success.

Flight No. 11

This flight is used by my good friend Mr. Des Healey of Fish Hoek and myself and we are loath at this stage to disclose our limited success in our experiment. All we want to say now is that by this time next year, we are confident that we shall have bred a new colour in a well-known lovebird species. Here's hoping anyhow!

Flight No. 12

I keep my four pairs of Masked Lovebirds (*Agapornis personata*) in this flight. With the exception of one hen, which is a so-called yellow Masked, the other seven birds are split-blues and are exceptional breeders. I am not enamoured with the looks of a blue *personata* but

I am able to use the blue as a good bargaining item when exchanging birds. With the exception of the yellow Masked each pair has bred twice this year.

Flight No. 14

My pair of Senegal Parrots (*Poicephalus senegalus*) are quite matey but do not appear to have any desire to breed. As these birds were recently imported I have not given up hope.

Flight No. 15

This flight is reserved for a pair of Brown-headed Parrots (*Poicephalus cryptoxanthus*) but is used at the moment to house the youngsters bred in other flights.

Flight No. 17

My pair of African Greys (*Psittacus erithacus*) have mated and I am now giving them a suitable nest. Perhaps too late to breed this year but one never knows.

Any readers who wish to exchange ideas with me are cordially invited to write me (Alken Lodge, Orange Road, Newlands, Cape, S.A.), and who knows, we may be able to exchange some stock in the future.

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BIRD NOTES FROM EVERYWHERE

By J. DELACOUR (Clères, France)

It is now a year since I have retired and dispersed my bird collection at Los Angeles. I cannot say that I do not sometimes regret my aviaries there, or the museums I directed for nine years. My little garden was a great pleasure, and in Southern California one can grow in the open practically all the species of plants one sees in cold and temperate houses elsewhere, and any birds, including the most delicate ones, could be kept outdoors all the year round. It all was fun, but the page has been turned on that part of my life. My present situation has obvious advantages: I have much more time to enjoy Clères and its innumerable birds, to travel and to visit friends all over the world.

There still are wonderful private collections of birds in the United States, in England, in France, and elsewhere, which it is always a delight to visit. We hear too little about them because their owners have not enough time for writing, which is most unfortunate.

CLÈRES, 1961

As I am now planning to spend a couple of winter months in California and two or three in New York, the collections at Clères have been considerably increased in the course of the present year, particularly those of small birds. The principal outdoor aviaries have been done up, the greenhouse transformed and replenished. There are a good many indoor cages as well. Among the new birds, are a dozen Humming Birds, brought from Brazil by Dr. E. Beraut ; Sunbirds, Sugar-birds, and various insectivorous and fruit-eating birds, so that it looks much as in previous years. The collection of doves brought from Los Angeles is excellent and the following species have bred : Crested, Bronze-wing, Martinique Quail, Grey-headed (*G. caniceps*), Philippine Pheasant-tailed, Blue Ground (*Claravis pretiosa*), Talpacoti, Pygmy, Peruvian, Silver Diamond, etc. There are now in the central outdoor aviary a pair of Inca Terns, very tame and pretty, as well as Cotton Teal and African Pygmy Geese. Mr. Ed. Boehm has sent us various Sugar-birds and Barbets, including the charming *Eubucco bourcierii* from Colombia, green above, yellow below, with red head and a light-blue nuchal collar. We have five species of Touracous : Knysna, Sclcutti's, White-eared, Pink-crested, and Ross. A number of Macaws are flying free, others being caged, particularly Lear's, Hyacinthine and the Golden-green *ambiguus* which resembles the Military, but is larger and yellower. We have two species of Screamers and a Cariama. Game birds are numerous and include, Congo Peacocks and Brush Turkeys (loaned by the Antwerp Zoo), Black and Plumed Guinea-fowl, and White Eared Pheasants. The waterfowl collection is almost up to the pre-war standard, second only to that at the Wildfowl Trust, Slimbridge.

This has been a poor breeding year because of the warm winter and cold spring which have upset the birds, resulting in suppressed clutches or clear eggs in many cases. However, we reared a number of Rheas, one Stanley Crane, some geese, ducks, and pheasants, and a Brazilian Curassow. A number of new pens and aviaries, as well as a deer park, will be renovated during the next winter.

ENGLAND

I was, for a few weeks, in England in April and again in August. Besides Whipnade, now much improved, and the excellent Chester Zoo, I had the great pleasure of visiting several very good collections. My old friend Captain R. de Q. Quincey has in Herefordshire the best collection of Humming Birds, Sunbirds, Sugar-birds, Tanagers, and various small Softbills to be seen in Europe, excellently housed in beautiful greenhouses and planted outdoor aviaries. The garden is lovely and it all is arranged with great taste. The aviaries are not overcrowded, a very rare feature in the world of aviculture, although the

numbers of species represented is large. Among the Hummers, are such rarities as Heavenly Sylphs and a Giant (*Patagona gigas*), and a pair of Purple-bellied Sunbirds (*Nectarinia purpureiventris*) probably represent the finest species of the whole family.

At Lower Haselor, near Evesham, Worcestershire, Mr. R. Partridge has a very large collection of birds, extremely well installed and kept. It consists mostly of parrots and parrakeets, many of which are successfully reared each year. During the last few years the number of aviaries has been increased considerably. Besides Psittacines, Mr. Partridge keeps many species of doves and a number of other small birds. I was delighted to visit him again and to find that he has one of the outstanding collections of the world.

I took much pleasure in seeing again this year, as I did last autumn, the excellent collections of waterfowl and other birds of Mr. E. O. Squire, at St. Neots, Huntingdonshire. The lovely garden which surrounds the large enclosures adds much to the beauty of the place, as do Formosan Deer and Dama Wallabies. The tame Occipital Blue Pie, which usually flies free, was locked up this time during its moult. Mr. Squire has a very complete collection of geese and ducks, and he rears many of them.

The pheasants and other game birds in the Ornamental Pheasant Trust collection are housed at Mr. Philip Wayre's farm at Great Witchingham, Norwich, until another location can be found. The best birds of the now dispersed Leckford collection are there, as well as such rarities as Bornean Argus, Bornean Firebacks, White Eared Pheasants, and Cabot's Tragopans. Three young of the latter species have been reared, and also some Temminck's and Koklass. Mr. Wayre has an assorted collection of mammals and a lot of waterfowl, one of the finest in Europe.

Although it is a public garden, the "Birdland" of Mr. J. C. Hill, at Bourton-on-the-Water, Gloucestershire, should be mentioned here. It is extremely well laid out and kept, and the birds look very attractive among the trees and the flowers. There are many interesting species represented; I noticed particularly a pair of the very rare Swift Parrakeets and some Great Black Cockatoos (*Probosciger*). Free homing Budgerigars are particularly charming in this comparatively small but beautiful garden.

After more than twenty years, I have seen again the Paignton Zoo, where I was so often in the past the guest of my late friend Herbert Whitley. The zoo itself is much as he left it and very well stocked. The tropical house is still lush with tropical vegetation; the excellent parrot house, and many indoor aviaries are well kept and contain many good birds.

Before leaving Europe, I should state that the Paris Zoo has now quite a good collection of birds, both at Vincennes and at the old

Jardin des Plantes which Professor Nouvel is trying to revive. An old indoor domed cage (which, in my childhood, used to house a Rhino !) has been very successfully transformed into a large and high aviary. Three Purple-headed Glossy Starlings (*Lamprocolius purpuratus*) have produced three young, and a pair of Crowned Pigeons is sitting on a nest of twigs which they built high up on a dead tree. At Vincennes, five flamingoes of three different forms have been reared (European, American, and Chilean), as well as five Black-necked and three Whooper Swans.

UNITED STATES

Aviculture is flourishing in America, in both public and private establishments.

Among the zoos there are several wonderful collections managed by highly-skilled curators. I can only mention a very few, with which I am particularly familiar. In New York, Mr. W. Conway, now the Director of the Bronx Zoo, has been remarkably successful. To mention only a few facts, he has successfully captured and brought home from the high Andes of Bolivia twenty Jameson's Flamingoes and some Andean, two species never before seen in captivity. He has also kept for several years the difficult Puffin. Under his supervision, many unusual birds have been kept and reared.

Mr. J. Griswold, at Philadelphia, has also been extremely successful, particularly in breeding Cranes, Flamingoes, and waterfowl, as well as Inca Terns, Motmots, and Crested Barbets (*T. coffer*) and in keeping many difficult small waders. The Philadelphia bird house is the finest now existing.

Mr. K. C. Lint, at San Diego, and F. Stark, at San Antonio have also been conspicuously successful, and a Humming Bird was reared last year at Cleveland.

Among the innumerable amateurs, I can only mention now some of my close friends.

At Elberon, New Jersey, Mrs. M. Erlanger has several beautiful and well kept aviaries where she keeps small and medium-sized birds, mostly softbills. She has many rare species, and, last year, she reared a Knysna Touracou, several Colombian Red Cardinals (*R. phoenicea*), Buff-naped and Silver-throated Tanagers (*Tanagra ruficervix* and *T. icterocephala*).

Mr. Ed. Boehm possesses near Trenton, New Jersey, the richest private collection of birds now in existence anywhere in the world. It is beautifully housed in a long building with many indoor cages and aviaries, and in numerous outdoor flights, some very large, carefully laid out and planted. There are some parrots, pheasants, and waterfowl, but the most remarkable of his birds belong to the softbills and fruit-eaters, of which he has tremendous numbers. The aviaries are so vast that a number of Sunbirds live together in them without

fighting, a state of things that I had never witnessed before. There are also Humming Birds. The series of Tanagers, of Sugar-birds, of small and large insect-eaters, and of many other small birds is wonderful. There are many flycatchers, including the Paradise. Of the larger birds I noticed several species of Touracous, Barbets, Toucans, Starlings, and Thrushes and a few Birds of Paradise. But it is idle to try to mention them all. Many breeding successes have taken place. Mr. Boehm has most originally and cleverly solved the problem of sheltering his birds from the severe winter weather. Each autumn he completely covers his flights with plastic material, thus changing them into vast greenhouses, heated by hot-water pipes. The plastic cover is removed in the spring.

No fewer than five attendants care for the birds. Mr. Boehm is famous as a maker of excellent and elaborate birds figures, appreciated all over the world. He is a most enthusiastic aviculturist.

In California, Mr. W. J. Sheffler, at Los Angeles, still has many parrakeets, francolins, and quails, and a number of small birds, among which the exquisite Rosita's Bunting, a very rare bird from Southern Mexico, blue above and pink underneath, never before seen in aviaries, which has been privately collected for him.

Mr. Ray Thomas, at Bel Air, has one of the very large world collections of parrots, parrakeets, and of small and medium-sized birds. One vast, planted aviary is full of Touracous, Rollers, Drongos, Jays, Magpies, Babblers, Toucans, Thrushes, etc., a wonderful sight. Another one contains hundreds of Tanagers, Sugar-birds, Trogons, small Barbets, and insectivorous birds of all sorts. A third one shelters many finches and other seed-eaters. Mr. Thomas only tries to rear parrakeets. A pair of imported blue-tinged Indian Ringnecks last year produced five pure blue young birds.

Mr. M. Straun, at Northridge, has large aviaries with a few score pheasants, waterfowl, and a magnificent series of pigeons and doves. He has reared many of them, including a number of Imperial Fruit Pigeons. In a large covered patio, he has a charming aviary of Tanagers, Sugar-birds, and other softbills, among tropical plants.

At Paramount is the excellent waterfowl collection of Mr. W. J. Parsonson, who also keeps doves, junglefowl, and Tinamous. He has been especially successful with Orinoco and Andean Geese, Black Swans, Andean Crested Ducks, Sharp-winged, and Laysan Teal. His triumph was the rearing, in 1960, of a Kelp Goose, a very difficult marine species.

Mr. H. Rudkin, continuing his father's work, keeps a tremendous number of birds at Fillmore, between Los Angeles and Santa Barbara, in the middle of his orange grove. He is well known for his great collection of parrots and parrakeets, the largest in America, and his breeding successes are considerable; last year, for example, three

hybrid Blue and Yellow \times Military Macaws, and some seventeen Grey Parrots, were hatched in an incubator and hand reared. But there are also Flamingoes, Black and Black-necked Swans, ducks and geese, Trumpeters, Cranes, Peafowl, Peacock Pheasants, many pigeons and doves, including Crowned Pigeons, as well as small birds, both seed eaters and softbills. A truly magnificent collection.

In the San Francisco area, Mr. and Mrs. Eric Kinsay, the veteran experts of difficult local birds, now keep only about thirty cage-birds, having disposed of their large aviaries. Mr. A. Isenberg still has one of the great world collections of fruit-eating and insectivorous birds, which include Birds of Paradise, Touracous, Sunbirds, Humming Birds, and Cocks of the Rock. The Golden Tanager (*Tanagra arthus aurulenta*) has often bred in his greenhouse. Red and Lesser Birds of Paradise have nested unsuccessfully these last two years.

Two excellent professional breeders should be mentioned here as they have been unusually successful for a number of years. One, Mr. F. Strange, at Redondo Beach, has reared annually hundreds of francolins, quails, and partridges, many for the first time in captivity. Among the rarest can be mentioned the Indian Spurfowl, and two species of Bush Quails. The other one, Mr. J. W. Steinbeck, at Concord, has been for thirty years a most excellent breeder of pigeons, doves, finches, Tragopans, Monals, and Peacock Pheasants.

To return to eastern North America, I would like to mention the magnificent pheasantry of Mr. and Mrs. W. Oakie, at Winston Salem, North Carolina. Their collection of pheasants is the largest and finest in the world at present, and they have been extremely successful with them.

Near Miami, Parrot Jungle, a show place, is quite remarkable. It is a beautiful, very well kept tropical park, with a large collection of parrots, most of them free flying. Macaws predominate, and they are trained to return to individual cages to feed and to sleep. Many have bred there, and one sees dozens of hybrids of all colours, the result of crossing and recrossing of four species: Blue and Red, Blue and Yellow, Green-winged Red, and Military. Rarer species are kept in aviaries, and there is also a flamingo pond.

Probably the best, and certainly the most nicely kept collection of waterfowl in America belongs to my friend Dillon Ripley, at Litchfield, Connecticut. He has a lake and several ponds, fed by streams, and most species are represented there. He was successful this year with Nenes and Laysan Teal, as well as with many other geese and ducks. Reeves's Muntjacs and Dama Wallabies share the birds' enclosure.

I hope these notes, made at random, will show our members that there are many fine collections of birds, all over the world, of which little is known, because little is written about them. I hope this will induce them to be less secretive about their own.

AN EXPERIMENT OF FREE-FLYING MANDARINS IN SCOTLAND

By J. C. LAIDLAY (Perth, Scotland)

Last year I thought it might be a worthwhile experiment to rear a few Mandarin and leave them full-winged.

In Scotland we have few slow-running streams or old trees with suitable holes in them for nesting in. This makes conditions quite different here to that in the south of England, where, as we all know, Mandarin are thriving in a wild state. In due course four pairs were flying in and out of our garden and on to the River Tay, which runs past the garden. This state continued all through the winter. By early spring the birds were busy hunting all the neighbouring trees for nesting sites ; unfortunately two drakes had paired together, but one drake paired with two ducks. The first casualty was the death of a drake from starvation ; it, in the search for nesting sites, had gone down the chimney of a shed in our ground. I only found it by chance when I happened to look into the building and then saw him dead on the floor and with him two very thin ducks, as this was the drake who paired with two ducks ; however, they did in time recover. Next a drake was seen on the chimney-pot of a nearby empty cottage ; he, too, must have died and possibly his duck with him. We had hung some boxes fairly high up and there were all the nesting-boxes in the garden, none of which they used. One duck we saw had made use of one of the high-up boxes, she hatched out five young which were seen at various stages of growth on the river. A second duck must have found a nesting site, as another brood of four was seen on the river. About a month ago (in July) two drakes returned to the garden and remained there. As I expected, two must have died. Then shortly after them a duck came in to stay, so she must have either had her eggs taken or lost her young. Now at the time of writing these notes (August, 1961) the two last year's drakes and two last year's ducks are staying in the garden and four young ones, bred on the river, are also with them. Possibly there is still a duck and brood on the river. This has been a bad year for chances of birds rearing their young, as it was exceptionally dry and cold, with very late frosts, so little fly on the water. It does show, however, that Mandarin would hold their own in Scotland if they could find suitable nesting quarters. I might add that we have resident otters on this stretch of the river, several Carrion Crows and flocks of Jackdaws.

THE ORIENTAL PRATINCOLE :
NON-DETERMINANT LAYING AND ARTIFICIAL REARING
AT THE NEW YORK ZOOLOGICAL PARK

By WILLIAM G. CONWAY and JOSEPH BELL

While captive collections have recorded increasingly successful breeding results with shore birds in recent years, it appears that the 1961 rearing of Oriental Pratincoles, *Glareola maldivaram*, at the New York Zoological Park, is a "first breeding".

This paper presents evidence for non-determinant laying by the Oriental Pratincole and records, for the first time, an incubation period. The aviculture of the captive breeding and rearing is described.

Male and female pratincoles were received on 10th June, 1959. Both birds were soon observed to undergo a pre-basic moult (moult nomenclature that of Humphrey and Parkes, *Auk* 76 (1): 1-31, 1959), leading to an eclipse or basic plumage lacking the characteristic pectoral necklace. This plumage was followed by a pre-alternate moult in which the pale gular coloration and pectoral necklace appeared during January of 1960. An "eclipse" does not seem to have been previously reported for this bird.

Again, in January of 1961, the alternate or breeding plumage appeared, and although no courtship, display behaviour, or territorialism was observed, the female fashioned an unlined nest scrape in one corner of the group exhibit in which the birds were housed, and deposited an egg on 28th March. The pratincoles were immediately removed to an off-exhibit breeding cage where they deposited, in the next forty-seven days, fifteen more eggs.

All eggs were removed from the nest as soon as discovered, and incubated artificially. The Table below records the course of the nesting:—

Egg.	Date laid.	Fertile x, Infertile o.	Incubation Period.
1	3-28	x	20.02 days
2	4-13	x	21.50 "
3	4-15	—	Broken "
4	4-18	o	—
5	4-21	o	—
6	4-23	x	18 ± .5 days
7	4-24	x	19 ± .5 "
8	4-28	x	18.31 "
9	4-29	x	18.59 "
10	5-1	x	18.5 ± .5 "
11	5-5	x	17 ± .5 "
12	5-6	x	18 ± .5 "
13	5-8	—	Broken "
14	5-10	—	" "
15	5-12	x	18.5 ± .5 "
16	5-14	x	18.5 ± .5 "



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NEWLY HATCHED ORIENTAL PRATINCOLE. NOTE EGG SHELL.

[To face p. 194



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ORIENTAL PRATINGOLE CHICK NINE DAYS OLD.

From the Table it will be seen that the most frequent interval between the deposition of eggs was two days (seven cases), but that intervals of one day occurred in three instances, three days in two instances, and four days in two instances. A clutch pattern is not evident from the Table so that, in this case, the Oriental Pratincole behaved as a non-determinant layer.

All of the eggs were set, immediately upon discovery, in a forced-draught incubator which was maintained at $98^{\circ} \pm 5^{\circ}$ F. Hygrometer readings varied from 84° F. to 88° F. during incubation, and each egg was turned at least four times daily. Experimentation has demonstrated that the eggs of Killdeers (*Charadrius v. vociferus*) hatch normally under these conditions at the twenty-five to twenty-six-day natural incubation period. This the 18.7 -day incubation period averaged from the Table above is believed normal. All fertile unbroken eggs hatched. The only other recorded incubation period for a pratincole of which we are aware, twenty-one days, was recorded by W. MacGillvray (*Emu*, 24 : 81-85, 1924) for *Stiltia isabella*, a somewhat larger species. The surprising spread in incubation periods from $17 \pm .5$ days to 21.5 days may not be so random, as a first glance indicates. Evidence worthy of further investigation is accumulating in our records, suggestive that the last laid eggs of some Charadriiform birds may require a shorter incubation period than the first eggs of the clutch !

Eight young pratincoles were reared successfully in brooders. The chicks were fed, by hand, a mixture of fresh fish and meat, supplemented with Vi-Penta, the first few days. Soon, within eight days, most were picking readily for themselves and taking the usual insectivorous food fed their parents. One chick weighed 5.8 gms. at hatching, 6.6 gms. at three days, and 11 gms. at seven days.

* * *

BREEDING THE KING EIDER, 1961

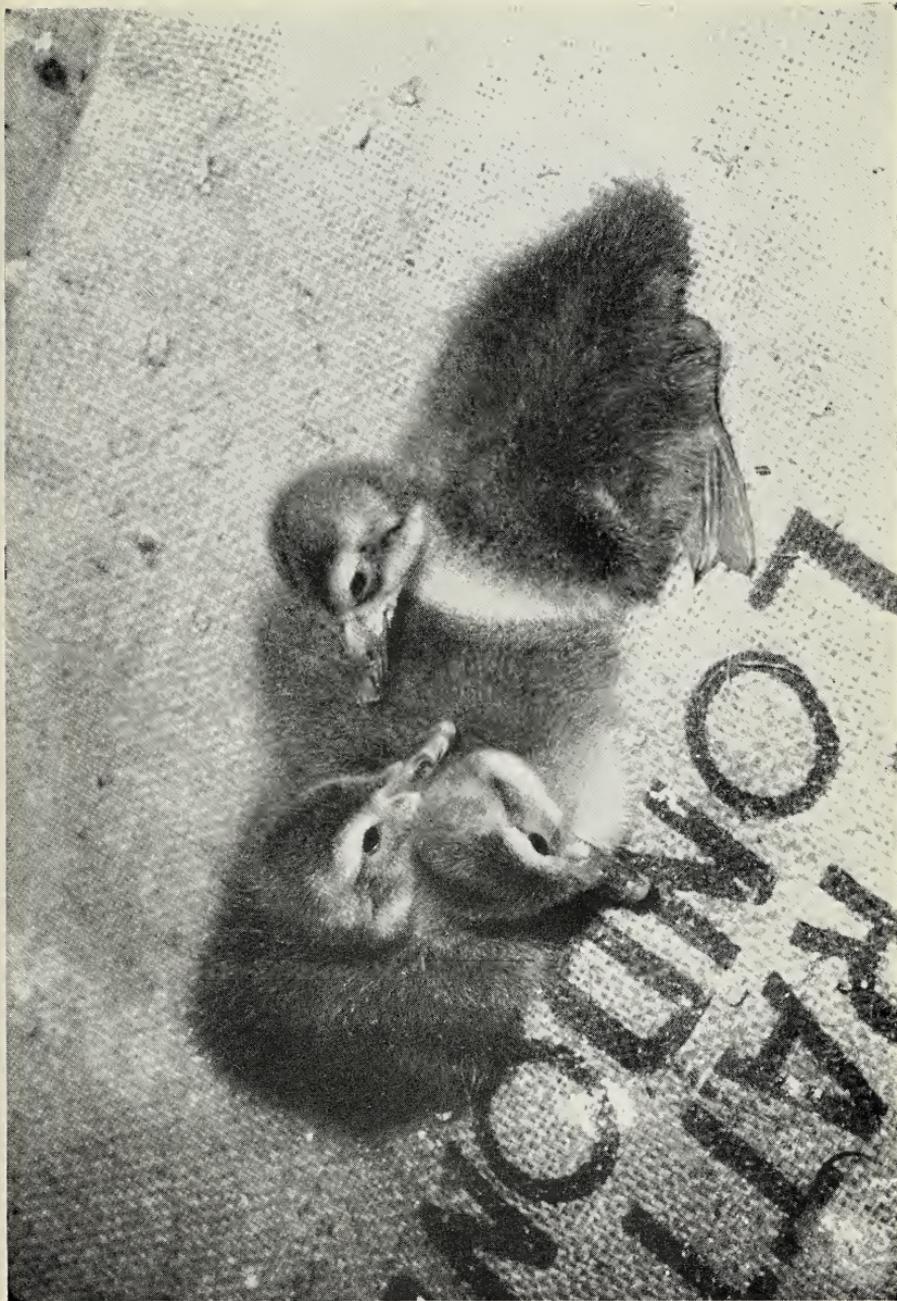
By S. T. JOHNSTONE (Slimbridge, Glos., England)

What we believe to be the first breeding record in captivity of the King Eider (*Somateria spectabilis*) occurred at Slimbridge this season. The species has been represented in our collection since 1955. The original bird, a fine adult drake blown on to the deck of a fishing trawler, was caught and taken to Reykjavik Museum where our good friend Dr. Finnur Gudmundsson, finding the bird quite tame and prepared to feed, decided it had a good chance of surviving the air journey to Slimbridge. Subsequently, through the kindness of the Copenhagen Zoo, the only known female in captivity was sent over to keep our lone male company. Later a further two pairs were added from the same source.

The main concern was to establish the eiders in their unusual surroundings and to supply an adequate diet to bring these magnificent birds successfully through the moult. Over the past few years a great deal of display and pairing had taken place, but no attempt to nest had been made. However, in early June this year a female was found sitting on a small indentation she had made on the short grass in our Rushy Pen. The scrape was a rough affair into which sub-surface clinker protruded, so much so that one feared for the safety of the eggs—indeed the first egg sustained a cracked shell. In consequence a further lining of protective grass was added to the scrape when the duck was away feeding. Two eggs were laid the first day and a third and fourth on the following two days. These, when thinking of eiders, seemed small, pale olive in colour, less green than those of the Common Eider, and pointed in shape; they measured 65 mm. by 43 mm. and averaged some 68 gms. weight. The down was pale fawn in colour and scanty in amount when compared with other species.

The eggs were incubated by a Rhode Island bantam. Three were fertile and pipped after twenty-two days. The first duckling hatched on the twenty-third day.

The incubation period of the King Eider has not hitherto been recorded. This is four to five days less than the period of the Common Eider. The newly hatched young differ considerably from those of the Common Eider. The down is a light brown above, with pale fawn on the underparts. The cheeks are pale with a dark sub-orbital stripe. An unknown and striking feature is that the bill is pink, tipped with slate grey, although at the end of a week the pink had almost completely disappeared. The head and bill do not give the impression of being wedge shaped as in the case of *Somateria mollissima*. The down continues from the forehead over the top third of the culmen. The tarsus is typical and slate grey in colour.



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KING EIDERS AT THREE DAYS.

[*Philippa Scott*

[*To face p. 196*

The following foods were offered—mosquito larvae, fresh-water shrimp, maggots, chopped liver, ants' eggs, chopped egg, starter crumbs, minced eel, bread crumbs, chopped earthworms, dried shrimp, fish meal, and wheat germ meal. The bantam was a most attentive parent and continually dropped shrimp and morsels of food in front of the ducklings. But for the first four days no efforts on her part, or indeed ours, could persuade the ducklings to feed. Occasionally, through the unending efforts of the bantam, they would take a peck at gammarus, but it was not until the fifth day that one duckling commenced to feed freely on shrimp and the meal mixture. After another day, a second bird was feeding. At a week one duckling died, but both the remaining two started to eat the shrimp and larvae in quantity and after ten days were tucking into a mash of fish meal, dried milk, wheat germ, and turkey starter crumbs.

Feathering commenced at fourteen days and at a month the birds were virtually fully feathered. The plumage is of a lighter brown than the Common Eider and the sexes are similar at this age, though at the time of writing, when the birds are three months old, the male's bill is developing a pinkish hue and the tail feathers are prominent.

* * *

LONDON ZOO NOTES

By J. J. YEALLAND

One species and two sub-species new to the collection have been received during the past two months. These are Schrank's Tanager (*Calospiza schranki*), Spengel's Parrotlet (*Forpus passerinus spengeli*), and Caribbean Bananaquit (*Coereba flaveola luteola*).

Schrank's Tanager inhabits the upper Amazonian area—south-eastern Colombia, eastern Ecuador, western Peru, western Brazil, and northern Bolivia. Spengel's Parrotlet is a native of the dry region of Santa Marta, Colombia. The most noticeable feature of the male is the pale blue rump. *Coereba flaveola* ranges over a large part of tropical and sub-tropical South America, Central America and islands in the Caribbean area, over thirty races being recognized. The food consists of small spiders, insects, and the nectar from flowers, the birds being particularly fond of sweet foods. Writing on the Bananaquit of Tobago (*Wilson Bulletin*, 50, 1958), Alfred O. Gross states that the presence of nectar-bearing flowers is a factor in determining its distribution and local abundance. In cases where the nectar cannot be reached in the ordinary way, the Bananaquit pierces the corolla near the base. The sap of sugar cane is eaten whenever the occasion offers. On Tobago, where they are also known as the Sucrier or Sugar Bird, the Bananaquits come to verandahs or the open dining rooms of hotels in

order to eat sugar from bowls or undissolved sugar from cups, taking it even when the guests are still seated at the tables and coming regularly at tea-time for this purpose. They also enter bars in order to sip liqueur left in glasses. Gross says, "At the Blue Haven Hotel I saw five Bananaquits at one time so engaged and the bartender informed me that the birds visited him at all times of the day to obtain the 'exhilarating' fluid. However, I never detected any unusual behaviour on the part of the birds after such indulgence."

Other arrivals of especial interest are three Boatbills (*Cochlearius c. cochlearius*), two Black-crowned Night Herons (*Nycticorax n. hoactli*), two Little Blue Herons (*Florida caerulea*) in the white immature plumage, two Spoonbills, two Avocets, two Curlew, two Grey Plover, one Lapwing, one Diademed Parrot (*Amazona autumnalis diadema*), one Great-billed Parrot (or Parrakeet) (*Tanygnathus megalorynchus*), one Hodgson's Golden-backed Woodpecker and two Toucan Barbets (*Semnornis r. ramphastinus*).

There are three longevity records of interest, a Stone Curlew dying after thirteen and a half years, a White-winged Trumpeter after eleven years, and a Chestnut Sparrow (*Sorella emimibey*) after eleven and a quarter years.

* * *

BRITISH AVICULTURISTS' CLUB

The seventy-fourth meeting of the Club was held at the Windsor Hotel, Lancaster Gate, London, W. 2, on Monday, 18th September, 1961, following a dinner at 7 p.m.

Chairman : Mr. K. A. Norris.

Members of the Club : Miss P. Barclay-Smith, P. S. Bates, A. W. Bolton, Mrs. R. E. Darnton, J. O. D'eath, M. D. England, Miss R. Ezra, Colonel H. B. Finch, Mrs. O. L. Gent, Dr. R. Gottlieb, L. W. Hill, Miss R. Hill, Dr. E. Hindle, F. E. B. Johnson, Miss E. M. Knobel, A. J. Lambert, J. Lee-Hudson, R. F. Marshall, P. H. Maxwell, F. Mosford, G. S. Mottershead, H. Murray, W. R. Partridge, A. A. Prestwich, B. E. Robinson, R. C. J. Sawyer, E. O. Squire, P. Sutton, E. H. Tong, Mrs. H. M. Vane, Mrs. M. Williams, J. J. Yealland, D. Young.

Members of the Club, 34 ; guests, 29 ; total, 63.

Ernest H. Tong, Director, Whipsnade Zoological Park, showed the International Council for Bird Preservation's colour film "Birds of East and Central Africa", made by Mr. Bayard W. Reed.

ARTHUR A. PRESTWICH,
Hon. Secretary.

NEWS AND VIEWS

Dr. Edward Hindle, F.R.S., was designated an Honorary Vice-President of the Royal Geographical Society, on retirement as Honorary Secretary of the Society during the past ten years.

* * *

The result of the third annual Bald or White-headed Sea Eagle survey in New Jersey is again disappointing. Only one young one was seen. This compares with one last year and four in 1959.

* * *

P. H. Maxwell's pair of Severe Macaws, on deposit at Whipsnade Zoological Park, has reared one young one. This is probably a first success for Great Britain. A breeding account will appear in the MAGAZINE at a later date. Erroneous reports in the daily press gave the parents as Lear's Macaws.

* * *

Evidence of the great interest that is being taken by Australian aviculturists in the *Neophema* group is the fact that at the 1961 Annual Exhibition organized by the Avicultural Society of South Australia there were no less than ninety-nine entries staged by eighteen exhibitors. All species, with the exception of the Orange-bellied which is totally protected, were on show.

* * *

The Spur-winged Goose (*Plectropterus gambensis*) has been successfully reared at the Caribbean Gardens, South-west Florida. Early in May, 1960, a nest of seven eggs was found. These were placed in an incubator and on the thirtieth day two hatched; the other five were infertile.

Marvin C. Cecil, Curator of Birds, is to be congratulated on his outstanding success in fully rearing the two young ones—both have proved to be males. Julius Fleischmann, owner of the Gardens, thus has the honour of recording an American first breeding success.

* * *

Dr. H. D. Groen, Groningen, Holland, reports a very satisfactory breeding season, 1961. "Six Kings, all hand-reared and very tame; three Crimson-winged; six Barraband's; seven Princess of Wales's; twenty Pale-headed Rosellas; three Pennant's; one Red-rumped; four Bourkes; three Splendids; one Elegant. The four pairs of Turquoisines have been very prolific, last year rearing thirty-six young in two broods and this year twenty-eight, again in two broods. Red-rumped were used as foster-parents and fully reared one Mealy Rosella, two Bourkes, and one Red-rumped, all in the same nest."

* * *

Dr. J. R. Hodges writes : " My pair of Blue-winged Grass Parrakeets, about which I wrote in the September-October, 1960, number of the MAGAZINE, have nested twice and produced another seven youngsters this year. One of the young birds developed a growth in its neck and had to be destroyed but the other six are fine specimens and appear to be three cocks and three hens. A young pair of Turquoise Parrakeets laid fourteen eggs in three clutches, hatched them all but succeeded in rearing to maturity only one of the chicks. Blue-faced Parrot-Finches laid several eggs but took no further interest in them."

* * *

In the last number of the MAGAZINE (page 165), Professor Carl Naether queried if and when the Splendid or Scallop-necked Pigeon (*Columba speciosa*) had been reared in the United States. According to my records the Professor's success would appear to be a " first " not only for the United States but for anywhere.

The only record for *C. speciosa* concerns a hybrid with a female American Spotted Pigeon (*C. maculosa*). Jean Dalacour reared three young ones of this cross in 1915 and two in 1916, and writes : " these pigeons have never ceased to nest for over a year, and I have at present five hybrids, three of which are adults " (see *Avicult. Mag.*, 1916, p. 275).

* * *

Sir Crawford McCullagh, Bt., in reporting the parrakeet breeding results, 1961, at Lismara, says : " They are very disappointing, but with so little sunshine and two nights of heavy frost on the 27th and 28th May, I am afraid there were many dead chicks in the nests." The following young were reared : three Ring-necked, parents blue cock and yellow hen ; three Ring-necked, parents blue cock and green hen ; three Yellow-bellied ; ten Yellow-rumped ; three Pennant's ; one Bauer's ; three Rock Pebbles ; three Princess of Wales's ; three Barnard's ; two Plum-headed ; one Bourke ; three Blue-winged ; four Elegants ; nine Splendids ; two Barraband's ; three Layard's ; and six Nyasa Lovebirds. Ducks : seven Common and fourteen Cinnamon Teal ; seven Chiloe and five American Wigeon ; one Pintail ; and eleven Carolina. Eleven Golden Pheasants and six Chukor Partridges were also reared.

* * *

The Edward Marshall Boehm aviaries. Charles Everitt reports : " I really thought that we had come to the end of the breeding season with the arrival of September but such is not to be. Actually we have had, and are still having, a real Indian summer this month, way up in the 90's, and it is decidedly better than was August. The birds must have sensed its coming for several have started nest building once more. I think we will finish up with quite a creditable performance.

What we regard as the best is having six young Bengal Pittas. They are getting on well but, unfortunately, we lost the breeding male to a rat. In some ways I guess that a breeding hen is more valuable but it is a shame that the pair is split now. I feel sure that at least two of the young ones are males so we can use one of them next year. Needless to say all the young are divided up, one to an aviary, for I was not taking any chances with them. I don't know, but I think that this must be the first breeding anywhere in captivity. I think the same applies to the Sulphury Tyrants from which we have one independent youngster, now four months old; and the parents have just gone to nest again.

So far this year we have sixteen different species with independent young, one other with chicks in the nest and four others with eggs in the nest. These last include the Bonaparte Euphonia and the Fairy Blue Wren. We also have Tacazze's building."

* * *

As a result of recent negotiations with the Trade Unions, a shorter working week and an increase in basic rates of pay came into operation in the printing trade during September. Due to these and other changes, the cost of producing the MAGAZINE has risen by no less than 40 per cent in the last two years. *Every* subscription is now of added importance to the Society. *Will all members please bear this in mind.*

A. A. P.

* * *

REVIEW

STUDIES ON THE BEHAVIOUR OF THE BLACK-TAILED GODWIT (*Limosa limosa* (L.)) By H. LIND. *Meddelelse fra Naturfredningsradets reservatudvalg. nr. 66, 1961. Munksgaard, Copenhagen.*

A most detailed account of the behaviour of the Black-tailed Godwit, based on long and painstaking observation and experiment. Reactions to predators, intraspecific fighting, courtship, and sexual behaviour, parental care, the behaviour of chicks, both before and after hatching, and territorial behaviour are described in great detail and discussed at length. Some shorter but equally important observations are made on feeding and other behaviour not specifically related to the breeding season.

This monograph is not exactly light reading and the lay reader may at times feel that the Godwit as a living fellow-creature is being obscured rather than spotlighted by the technical descriptions of its actions. But he should persevere since the mass of accurate information

given will undoubtedly increase his enjoyment when next he watches Godwits.

Among the wealth of information the reviewer found the accounts of hatching and how the supposed "egg-turning" behaviour of the parents in fact serves to keep the egg (and the chick inside it) in the *same* position; the tendency to nest near nesting pairs of Lapwings (whose greater readiness to attack predators may help to protect the Godwit's eggs) and the different feeding techniques of young and adult Black-tailed Godwits of particular interest.

D. G.

* * *

NOTES

INCUBATION PERIOD OF THE NORTH AMERICAN RUDDY DUCK (*Oxyura jamaicensis jamaicensis*)

I have kept the above attractive little Stiff-tail in my waterfowl collection for the past eight years. During that period with the exception of the first year, the species has regularly laid two clutches of eggs each season, varying from six to ten. I have incubated the eggs under bantams and latterly allowed the duck to incubate herself, after it was found that artificial rearing was not successful.

On every occasion careful records have shown that the incubation period is twenty-four days. I have also confirmed this with a fellow collector who keeps the same species. In Delacour's *Waterfowl of the World*, vol. 3, p. 228, the incubation period of *O. jamaicensis jamaicensis* is given as twenty to twenty-one days.

Whilst hesitating to differ in opinion with such undoubted authority, it would be interesting to know whether other collectors keeping the species in question share my experience.

If the evidence is strong enough and my experience is not isolated, then I think the record should be amended, if only for the benefit of those less experienced who may acquire the Stiff-tail in question in later years and use the reference I have quoted.

J. O. D'EATH.

NOTES ON THE 1960-61 BREEDING SEASON AT GIPPSLAND, VICTORIA, AUSTRALIA

The 1960-61 breeding season was only a moderately fair one; as my results show.

Red-rumped Parrakeet.—Nine, five cocks and four hens.

Golden-mantled Rosella.—One, a hen. The father, a magnificent bird, had only been trapped about nine weeks when his young hatched; a second youngster died in the nest.

Red Rosella.—One, a hen. The parents of this youngster were only a year old when they went to nest. Four more youngsters died in the nest. The cock bird is of the Tasmanian sub-species, *diemenensis*! I think. I'm not sure yet.

Many-coloured Parrakeet.—One, a cock. Reared by the hen alone after the sudden death of the cock bird. Some eggs placed under Cockatiel but the young were not fed.

Port Lincoln Parrakeet × Mallee Parrakeet.—Two hybrids, a pair.

Pale-headed Rosella.—Two clutches of clear eggs.

Turquoise Parrakeet.—After the death of the cock bird the three newly-hatched young died, probably from cold.

Yellow Rosella.—Another unsuccessful pair; eggs were broken by a Crimson Rosella, and the hen did not incubate further. The surviving eggs placed under other hens, one hatched, but was promptly killed.

Adelaide Rosella × Crimson Rosella.—One, a hen. An Adelaide cock mated to a Crimson Rosella hen after his own hen died with cerebral haemorrhage. Eggs were laid but the hen was a bad sitter and she reared nothing; but two eggs placed under another hen resulted in one young being reared.

Yellow Rosella × Crimson Rosella.—Synthetic Adelaide. Sharing the Yellow Rosella aviary was a Crimson Rosella hen, she laid five eggs two of which were fertile, they hatched but were not reared.

Cockatiel.—Four, of equal sex. One was reared partly by a pair of Budgerigars, finished by hand. This pair of Cockatiels refused to rear Many-coloured young.

Blue-wing Parrakeet.—Five, two cocks and three hens. First clutch of seven eggs, all hatched, but because of the smallness of the nest-box, and abnormal heat, five were lost at point of leaving nest. Second clutch four eggs, all fertile, three hatched, one young crushed other two reared. A second pair reared one.

Peach-faced Lovebird.—Three, two cocks and a hen.

Budgerigar.—Many Budgerigars of the common varieties including the wild green type. These birds are mainly kept for experiments in fostering.

Indian Lace-necked Dove.—One, sex unknown. Was given away as soon as it could fend for itself.

JOHN A. FELL.

* * *

CORRESPONDENCE

REARING EIDER DUCKS FROM IMPORTED EGGS

I imported from Iceland ten European Eider Duck eggs and they arrived at London Airport at the end of May. I had to get an import licence from the Ministry of Agriculture but this was no trouble although it took a few weeks for the actual approval to come through.

Two good broody hens were selected and they were given five eggs each. Towards the end of incubation I had only four fertile eggs which were put under one hen only.

Hatching occurred on the twenty-fifth day, but the eggs were cracked two days before that and the ducklings inside made a lot of noise!

The hen and four ducklings were moved to a coop and ran on the lawn. One duckling died when it was about eight hours old but the other three have never looked back and are now in their first feathers and seem to be good strong healthy birds.

They were fed on Turkey starter crumbs, dried flies, insectivorous food, and fish meal. Fresh water at all times which had to be changed often as they spent a lot of time washing themselves in it.

At three weeks of age they were gradually weaned on to Turkey starter crumbs only. Now, on the advice of Mr. J. O. D'earth, they are fed in the same way as he described in the AVICULTURAL MAGAZINE, vol. 64, number 6.

At six weeks they were put in a wire netting enclosure beside my main pond—the netting being gradually expanded so as to include deeper water.

Upon reflection I gather I was lucky to hatch four ducklings from the original ten eggs. Also I am sure the excellent weather during the first few weeks of rearing was a real help.

T. C. J. OWEN.

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The Editor does not accept responsibility for opinions expressed in articles, notes, or correspondence.

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